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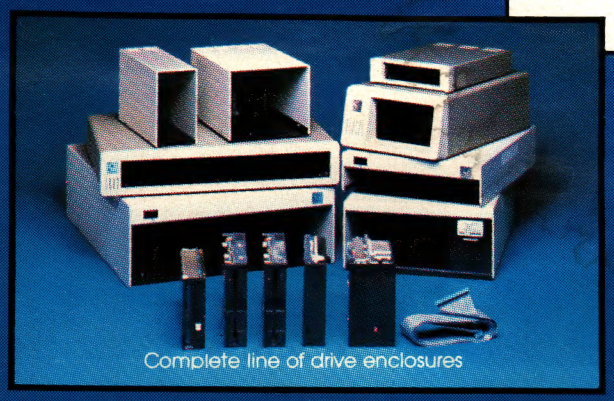
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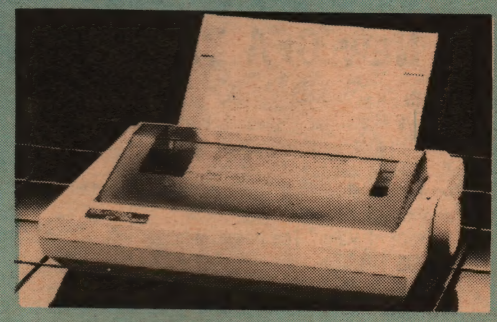

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Line Feed Speed: 6.7 lines/sec. (6 lines/inch)
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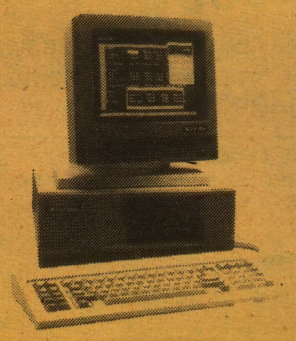

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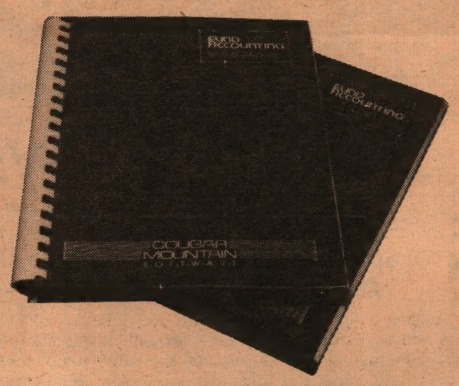

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LANS vs Multi-User

by Stan Veit

Back in 1969, if you asked the computer experts about the future, they would have told you about huge mainframes and timesharing. Everyone was going to have a terminal connected over the telephone network to the really, really big mainframe. Can you imagine what would have happened if this possible future had come to pass and then AT&T was broken up? Instead the personal computer was developed and the trend toward decentralization stopped the growth of the super huge mainframes. What we got instead was the growth of huge computer resources in smaller and smaller packages. Our AT-type computer today can command resources far greater than the huge mainframes of yesterday and our super minis have greater capabilities than the monsters we talked about twenty years ago.

The original idea of the personal computer, was that one person would have almost all the computer resources they required. The only problem is that peripherals are expensive and spend a lot of time doing nothing. This led to the idea that expensive resources should be shared among as many users as possible. In addition there are countless applications that require that many users share the same information. The isolated personal computer is not the answer for these applications, therefore some method of multi-user computing was sort almost from the start of the personal computer revolution.

Minicomputers had this ability, so it was to be expected that the first microcomputer to have multi-user capabilities was evolved from a minicomputer CPU. The Alpha Micro System was developed from the same family of processors as the DEC PDP-11 although it had different microcode. The chip family was the Western Digital WD-16 developed for DEC as a microprocessor version of the PDP-11 CPU. DEC canceled the contract with Western Digital so the founders of Alpha Micro re-wrote the microcode to produce the Alpha Micro CPU. This was the first 16-bit processor that could run in an 8-bit bus, enabling the Alpha Micro to use the popular S-100 Bus and many of the available S-100 boards. John French, one of the founders of Alpha Micro said, "We are a small company and we are not going to make and sell anything our customers can get on the open market." Using this idea, a customer could buy the Alpha Micro CPU and use almost any S-100 chassis, high quality static memory and I/O boards. Alpha Micro supplied the AMOS operating system including Alpha BASIC with the CPU and the result was a system that would support many users on the same computer. Disk drives, printers, modems and other peripherals were shared among all users and the system worked well once the major bugs were wrung out by 1978. Alpha Micro was one of the first personal computer companies to provide hard disks for their systems and once they were established they built the entire computer. In most cases up to ten users could share the first Alpha Micro Systems, if you added more the response time grew rather long when many disk accesses were required.

The development of high speed Z80 CPUs and multi-user operating systems such as Turbodos, MP/M THEOS/OASIS, FLEX, OS-9 and others contributed to the development of personal computer multi-user systems. Most of them were Master/slave systems where one Master CPU controlled the system and provided the peripheral support and each user had his own complete CPU and memory driving his remotely connected terminal. This system works well and is in use today by many active systems.

The main problem with this type of multi-user system is that it is time shared. Time sharing operates because each user only spends a small portion of the time using the CPU and other system resources. It runs into problems when many users must share the slower resources and they are locked out to any but the current user. A particular problem with the 8-bit multi-user systems was the small amount of memory (by XT/AT standards) causing frequent disk accesses. Since the disk is one of the shared resources, other users are locked out during disk reads and writes slowing down system response. Printers were also shared and had to operate from queues since they could only print one job at a time. Modems represent the same problem for time shared systems.

When 16-bit CPUs were made available for personal computers and the IBM PC/XT/ATs became the de facto "standard," the demand for multi-user systems declined. Now each user could have a separate printer, modem and hard disk with large amounts of on line memory and even larger amounts of cache memory. The total cost of a computer with all of these resources is less today than the 8-bit multi-user system of only a few years ago.

Although the demand for multi-user systems has declined, there is now a stronger need for communications between computers than ever before and the driving force is software and data. A business must provide access to information in a common database and only one person can be allowed to update the base at a time. Tasks may be done by several people in sequence and they should have the ability to interchange data for this purpose. Mail and other information may be needed by large groups of users at the same time and they must be able to respond to

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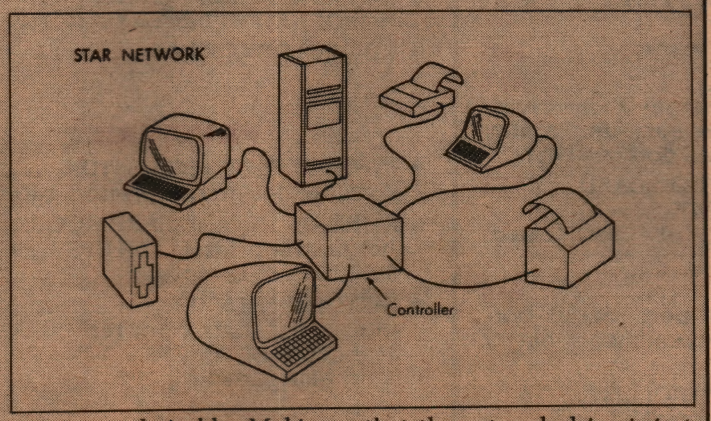
A LAN Primer

by Stewart I. Alpert



The past several years have seen an incredible proliferation of small computers in the workplace, bringing previously unheard of power to users. However, much of that power has gone to waste due to a lack of interaction and cooperation. If the team approach is the best way to accomplish a goal, then computers must have some way to interact and work together. Networks are the answer.

Computer networks are essentially the way to implement cooperation among machines. This cooperation is usually manifested in the sharing of valuable resources. The network is the communications channel through which the resources are shared. Shared resources are most devices such as disk storage, printers, and communications boards. Software systems are also shared. The resources themselves, also called services, are the functionality that these devices offer. By sharing a database, which can be thought of as an information resource associated with a disk storage device or a file service, many computers can be used to enter data simultaneously. Such cooperation among machines will most certainly accomplish a goal, such as entering several thousand names into a database, much more rapidly than any single personal computer could.

Cooperation among computers can also save money in hardware costs. Laser printers are the perfect example. A laser printer connected to a single personal computer spends most of its life waiting. Waiting for the PC user to turn his machine on, waiting for the PC user to finish his/her word processing document and send it to the printer. Laser printers don't get much done while they're waiting. Laser printers are rather expensive pieces of equipment. Wasting most of an expensive piece of equipment's potentially useful time is not very desirable. Making the laser printer a shareable resource on a network will increase its productivity by increasing its accessibility to others on the net. This also eliminates the need for redundant equipment.

In most PC-based LANs, services are provided by computers known as "servers." Servers are the machines that administer the services. Most of the services are based on the server machine itself (i.e. the disk drives associated with a file service is usually connected to the server). Servers can be computers or something entirely different such as any of the proprietary servers offered by companies like Novell, Banyan, 3Com, and others. The key element of the server is the network software that it runs. The network software (also frequently called the network operating system) is responsible for handling requests for services.

The requests for services most frequently come from computers on the network called "workstations." Workstations are typically PCs that need to use the resources of the server. These requests usually take place transparently to the user. The user on the workstation runs a modified DOS that allows resources on the server to appear as if they are attached to the workstation.

For example, a user who needs a file from a network server simply refers to a disk drive letter that has been assigned to the specific file service. To the user, it appears that the network drive is just another hard drive attached to their machine. The modified DOS (also called a network shell) makes requests to the server for the various file operations that the user wishes to perform. Similarly, a user that needs to use a network printer will usually send files to a "normal" print device (such as lpt1), and the shell will make printer requests and send the file to the printer.

In order to fully understand how networks function, it is necessary to create a meaningful model to represent the conglomerate of hardware and software necessary to have a network. The International Standards Organization (ISO) has given us the OSI model (Open Systems Interconnection model). This model is said to be a layered architecture. Each layer is built somewhat independently from the others. This feature allows one to change one layer, but leave the rest of the architecture intact. For instance, if a network implementor wants to run his/her network over copper wire in some places and fiber optics in other places, the only thing that must be changed is the physical transmission methods. Several layers up the model, the user sees nothing different. The OSI model is pictured below:

Layer	Purpose
Application	Network Services (File service, printer service)
Presentation	Data Format

continued on page 32

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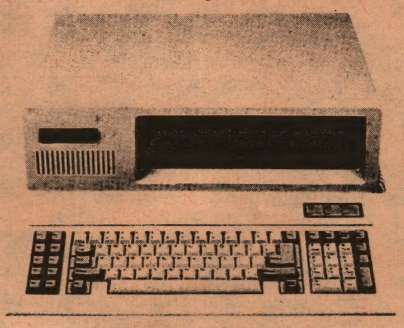

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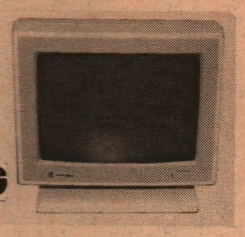

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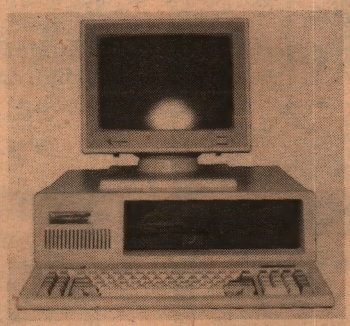

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Editorial

By Stan Veit

Researching for the article on LANs vs. Multi-user Systems I came across one fact that is disturbing. The whole field is utterly confused. There are many players in the game and it is almost impossible for prospective customers to determine which way they should go. The big winner to date seems to be Novel with 75,000 Advanced NetWare Systems installed serving over 500,000 workstations. The other players include 3Com, Ungermann-Bass, Corvus, IBM and many, many others.

IBM's Token Passing Ring system on IBM PC Network is widely admired but is said to work only on small networks. Some of the Novel nets with PC-to-mainframe gates serve up to 1,000 nodes. This type of LAN requires complex software and hardware.

What is really slowing down the urge to network is the lack of a 286/386 operating system that will provide for multi-user operation in the protected mode. Now Digital Research, the owner of CP/M has come out with Concurrent 386DOS to address just this problem. It should be remembered that DRI produced MP/M for the Z-80 which was the operating systems for many multi-user systems.

Another requirement just being addressed is the need to network graphics and other non-ASCII software. This is a requirement that was not even thought of at the start of network development but is vital to sharing of business graphics and networked desktop publishing applications.

In the field of multi-user personal computing, we actually seem to have gone backwards since the time of the 8-bit computer. There were many multi-user computer systems operating under CP/M and the other 8-bit systems. Many of them are still operating and will not be replaced by MSDOS computers simply because of the requirement for multi-user operation. Although users would like to use the more advanced software available under MSDOS, they will not upgrade until there is a way to provide the utility they now enjoy. It should be noted that Tandy continues to support their Model 16, Xenix (UNIX) based, multi-user systems although they are mainly selling their Tandy 3000 MSDOS computers to business.

I feel that the confusion in the market was caused by two factors, one was the hard sell of the partners in Ethernet. Remember the ads with the connector plate on the office wall? You were supposed to plug in everything in the office as part of the network. Well, Ethernet was years away but the level of expectations was raised to way up HERE! The other factor was the failure of IBM to come out with a complete PC Network using the Token Passing Ring at the time it was announced. Even if it had been incomplete, such a network would have made people realize that their requirements were being taken seriously.

Boy Did I Get Letters!

In the February 1987 issue, I printed a WARNING to TI 99/4A vendors to support our efforts to maintain coverage of this old, but still popular computer system. I must tell you that the WARNING worked. Ron Albright and Jonathan Zittrain, two devoted hobbyists who write our TI column, are receiving material to review and report about. We will shortly present a review of the new Geneve 99/4A upgrade computer which is being sent to Ron Albright.

The thing that amazed me was the reaction of the TI 99/4A readers, instead of writing to the vendors asking that they send press releases and review software, some of them attacked me! *Computer Shopper* is the only national magazine that covers TI 99/4A, we do it for the readers because we feel that there are large numbers of these computers out there and the users are unusually loyal. We get nothing out of it except that we do gain some readers. Most of the TI 99/4A software houses are too small to even advertise in *Computer Shopper*. We run their press releases for free in the column. I would hate to be unable to publish the column because we had nothing to print. Try writing a column month after month, keeping it interesting and informative. You need a lot of source material and our columnists Albright and Zittrain do a great job. Since I shook up the TI community and they responded with help, the column can continue as it has ever since before TI quit.

As to those who sent poison pen letters, or called to abuse me (you know who you are) I want to say that I meant every word of it. The TI column can't be the work of two guys working in a vacuum, it needs the cooperation of every member of the TI community who wants it to appear.

Round Three of Amiga vs Atari ST

In this issue is an article by Kenneth Jennings which is another round in the ongoing discussion about the relative strengths of two wonderful computers, the Commodore Amiga and the Atari ST. We have received a flood of mail about the two previous articles on this subject, much of it vituperative. I expect to get even more after Mr. Jennings' article appears. Some of these letters exhibit hate against me as Editor because I publish such articles. Why do I do it? Well, you are never going to get such discussions from either Atari or Commodore magazines and I believe that intelligent discussion is important for our readers who are trying to make up their minds about a graphic computer.

Welcome Ted Drude!

There is a new name on our masthead this month, but it is a name familiar to our readers. Ted Drude, who has written so much about Commodore and Heath/Zenith has joined our Editorial staff as Technical Editor. He has moved to Florida and will contribute to our growth in many ways.

Survey Results From Newsstand Readers

Last month I gave you some of the results of the survey of subscribers, this month I want to share with you some of the findings of the survey of single copy readers of *Computer Shopper*. Questionnaires were returned by 34% of those inserted in newsstand copies. This is an excellent response. The survey was conducted by Simmons Market Research Bureau of New York. Some of our readers have asked why a six year old magazine makes this kind of survey. Well, we are now dealing with large advertisers who want the word of an independent research firm that you are really out there. Direct response advertisers know that *Computer Shopper* readers buy a lot of merchandise, they don't need a survey.

The mean time spent with the magazine is 2.4 hours, that's a lot of reading. Most of our readers read the magazine at home (94%), others read it on the job (34%). 94% read the ads and 60% read the editorial, 36% the classifieds. The figures come out that way because there is a lot of overlap.

Over 60% read our theme articles and 34% want about the same amount of coverage, 14% want more and 0.7% want less. The Amiga readers are 29% of our readership and the Atari ST are 23% (very little difference). The readers of 8-bit Commodore articles are 37.2% of the respondents and 8-bit Atari are 19.8%. IBM/MSDOS readers are 74% of the respondents and 44% want more articles on the subject, only 3.5% want less coverage. That is to be expected but the amazing thing is that Macintosh articles are read by 22% and TI rates 21.8% and Timex/-Sinclair rates are 19%, Sanyo 18.9%. Unlike the subscriber, the single copy readers like Robots!

The request for more coverage on Applications Software is the same as the subscribers (over 70%). You will get the coverage. Computer Utilities are popular with 69.6% requesting more. Peripheral devices rate high with 63% requesting more coverage.

As might be expected, 95.3% of you own a computer at home and 78.2% use one at work. The largest ownership is MSDOS computers 65.6% with the rest divided among Commodore, Apple, Tandy and Atari. Amiga owners are only 3.8% and Atari ST is 3.2%. These types are only just starting, but surprisingly enough, Apple III owners rate 3.6%!

According to the survey most people bought a particular computer because of the price (70%) with brand reputation/quality rating 63% and special features rated 41%. Other factors are service record, compatibility with work or school, and package deals. Recommendation accounted for 25% of purchases.

All of the departments of *Computer Shopper* are spending a lot of time analyzing the results of the independent survey. The object of all this is to bring you a better publication closely tuned to your expressed wants. As Editor of this magazine, my job is to select the articles we print as well as the scope of coverage. I am paid by Patch Communications, but in a larger sense I work for you and I never forget it. ●

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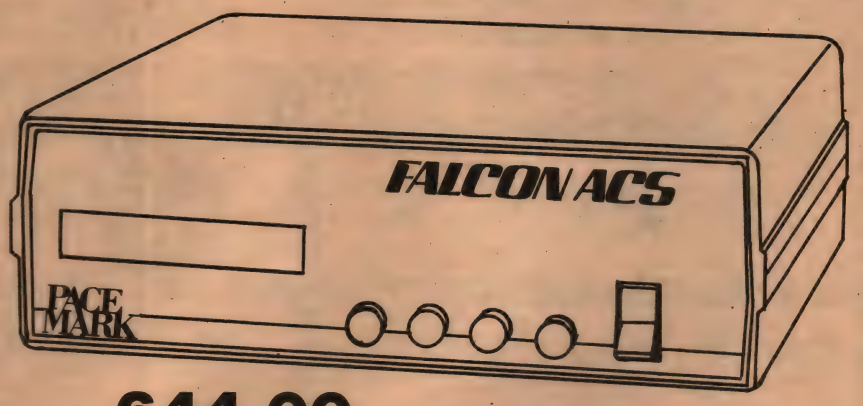

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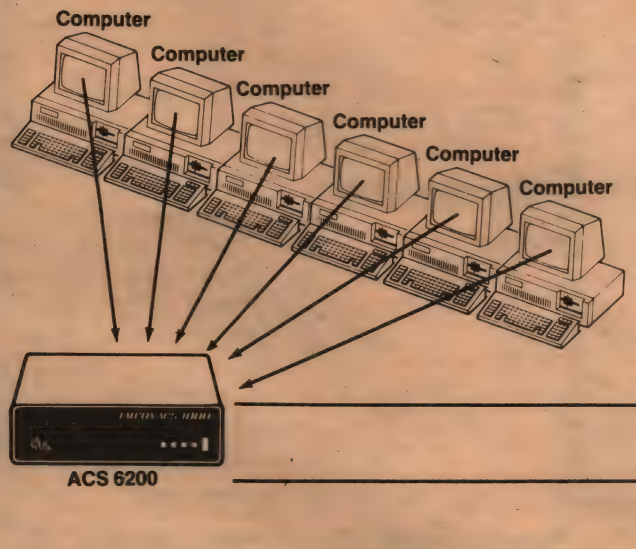

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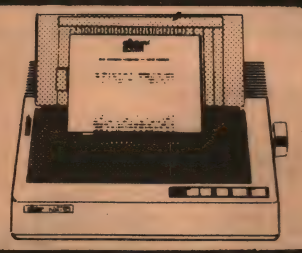

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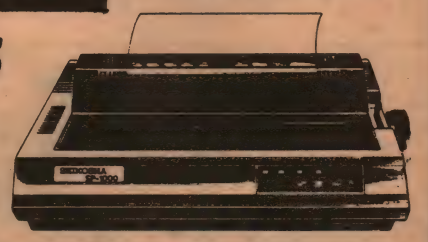

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Proteon's Networking Products Give Spectacular Performance

by Stewart I. Alpert

Faster, larger capacity, more capabilities, more connectivity... if spectacular performance in these areas is what makes a networking line hot, then Proteon is well on its way to becoming known as the top dog in the marketplace. While many companies are announcing their "new" and "amazing" technological advances and capabilities in the trade publications, Proteon has for years been quietly producing products that far surpass even the most recent developments. Based on proprietary technology, Proteon products deliver unparalleled performance coupled with unique operating advantages.

While there are several 10-megabit-per-second LANs on the market, ProNet-10, Proteon's flagship product, offers much superior performance. Most 10-megabit-per-second LANs are based on Ethernet technology, an older technology that suffers from slow effective throughput due to high protocol overhead. In English, that means: Although the transmission rate may be 10- megabits-per-second, the actual data transfer rate is quite a bit slower due to inefficiencies. The efficiency of Ethernet-based LANs decreases as the number of users goes up. ProNet is not an Ethernet-based network. Proteon networks give uniform high-speed performance regardless of the number of users. Also, ProNet's data transfer rate is as close to 10- megabits-per-second as possible (there is always some protocol overhead).

One of the most profound shortcomings of most networks is the inability to carry more than a single packet of information around the net at any given time. This means that there can only be, at most, one machine talking to another at one time. Using ProNet-10, many packets flow around the net simultaneously. This allows many machines to talk to each other at the same time.

Proteon's networking protocols have been around for quite some time because they were originally developed to network minicomputers, not PCs. Unlike PC-based network firms, Proteon has the hardware necessary to connect all kinds of machines to ProNet-10. Proteon excels at connectivity (one of today's popular buzzwords). Personal computers, minicomputers and mainframes can all share information and other resources on the same network.

Another advanced feature of ProNet-10 is its ability to use several different types of software over the net at the same time. This permits one user who needs to use a package that does terminal emulation on a PC to access a DEC Vax minicomputer over the net (perhaps TELNET from the PC-IP TCP/IP package), and several other users running Novell Netware, to coexist and use the network simultaneously. In fact, the number of different packages that may be run over the net at the same time is currently limited by the marketplace, not by the hardware.

Proteon hardware can be used to build networks consisting of one node (not a particularly useful configuration), to many thousands of nodes. The size of networks you can build using Proteon hardware is, in fact, not limited by the hardware at all; you can, theoretically, build networks as large as you can afford.

Proteon's proprietary network protocol also runs on an incredible 80-megabit-per-second LAN called ProNet-80. While Proteon does manufacture a PC card for ProNet-80, the 80-megabit-per-second hardware's primary usage in PC networking is to backbone (connect) several ProNet-10 LANs.

Proteon makes hardware to connect to other LANs besides ProNet-10 and 80, and also some WANs (Wide Area Networks). Its gateway products can be used to interconnect the ProNets, Ethernet, T1, and ARPANET. This advanced multiprotocol product can be used either to extend connectivity over a long distance, or to integrate ProNet with existing dissimilar networking products.

Proteon also makes an IBM Token Ring compatible network, a 4-megabit-per-second (same as IBM) single token, single packet network. ProNet-4 is useful in applications where one is connecting IBM microcomputers to IBM mainframes (and has a need to take advantage of the facilities offered on IBM mainframes) in a medium-performance network.

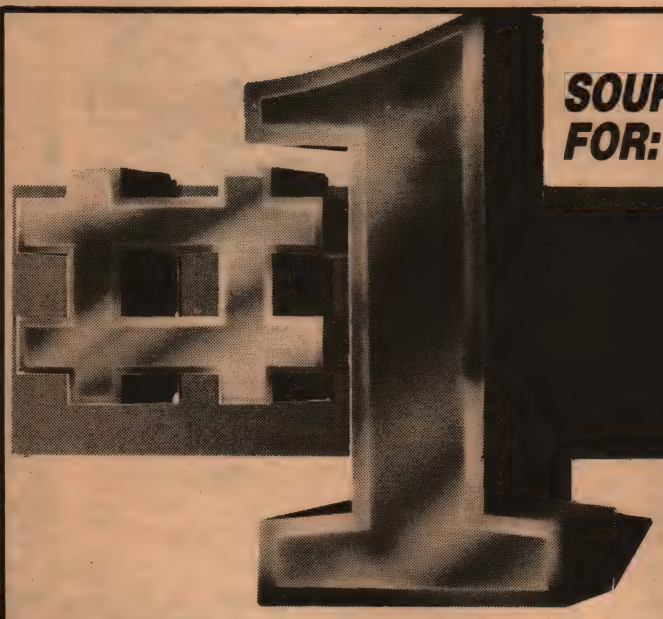
Proteon networks can be made to work in almost any environment.

Proteon has produced one of the finest assortment of multimedia network linking devices around. ProNet LANs can be run over copper, fiber, microwave and infrared links.

The various types of software that run on ProNet varies with the particular needs of the users. Proteon makes original-equipment-manufacturer versions of Novell's popular Advanced Netware to run on ProNet.

Another option is Banyan's Virtual Networking Software (VINES running on either of two proprietary 68000-based servers, or VINES/286, which runs on 80286-based machines such as the IBM AT). VINES

continued on page 32



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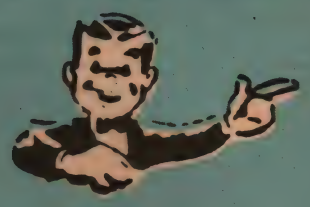

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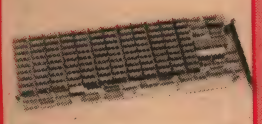

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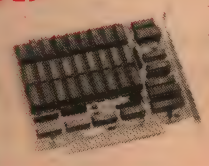

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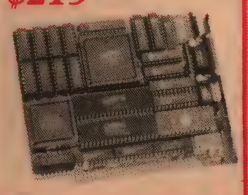

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- IBM EGA compatible
- 640 x 350, 16 colors
- 720 x 348 mono
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- Hercules compatible

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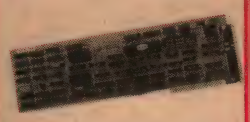

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- 720 x 348 Resolution
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- Runs Lotus 123 Graphics
- Printer Port

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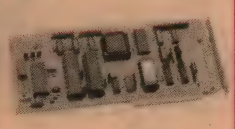

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- Works with Seagate ST225, ST4038, ST4026

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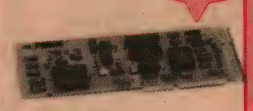

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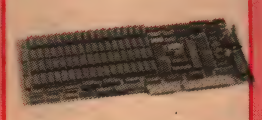

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- Clock/Calendar
- RAM disk, printer spooler
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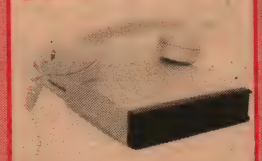

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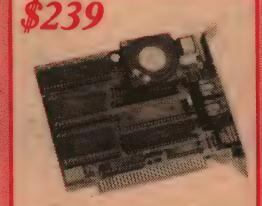

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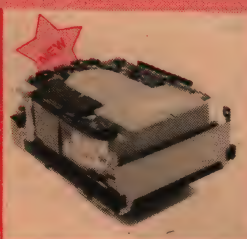

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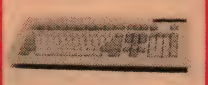

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- IBM PC/XT, AT compatible
- 95 key keyboard
- LED lights.

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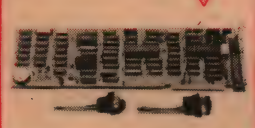

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- Monochrome high resolution 720 x 348
- Parallel printer port
- Serial communication port
- Game port

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- 1/2 size
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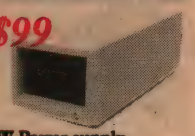

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- TTL
- 1000 x 350 resolution

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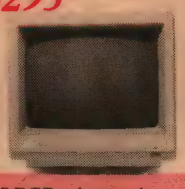

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- EGA & CGA compatible
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- Tilt & Swivel Base

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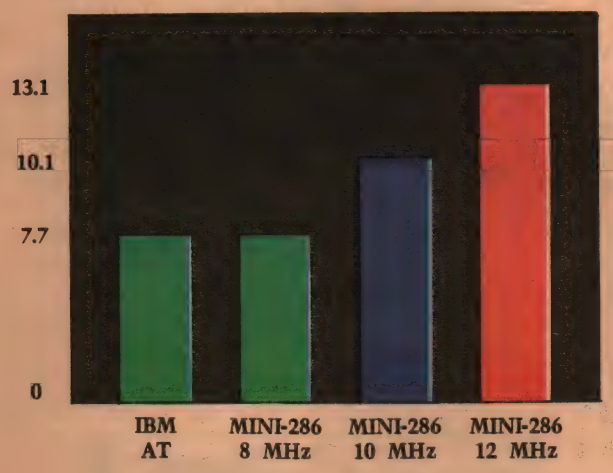

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The Saga Of Manny The Power Moocher

by Hal Anon

This is a story about Manny the Moocher! He was a low, down hootchy kludger. He had a heart as big as a hacker's and loved to fool around with micros, any kind of micro. It was this fascination which got him into trouble. He liked to play with all kinds of interfaces, processors, operating systems. He was equally at home in DOS, UNIX, Assembler, C, or Turbo Prolog; Z80, 68000, 8086, 8081, 286, or 386.

He thought that being such an operator, a real-time operator, was his destiny. A dedicated multi-user and multi-tasker should be free to live life to the fullest. He should be free to become the quintessential power user, envy of all the MISs (not to mention Ms.) and Gurus of the world. What he never could be was an average keyboard jockey. Just the thought chilled him to the bone.

Oh, how he loved to tickle the keyboards! He was a consumate artist. On the ivories, he was a virtual Vladimir Horowitz, or Ahmad Jamal. Then he ran into a particular micro that wouldn't let go. And in the end, at the moment of his greatest triumph, it did him in. This is his story.

He avoided any exclusive attachment. Every component of his being had a multi-interface and could be ported to virtually any system. The important part which he jokingly called "his mouse" had a male omniport connector, with independently defined—keys, and could be quickly reconfigured for Atari, Commodore, IBM, Mac, or any other.

He believed that "open architecture" was the natural condition of computerdom, and under that regime he blossomed and thrived. He loved to brag about his conquests. You might say Manny was a flying high until his come-uppance, a tunnel-effect loop on a dark night. Manny ended his mooching on that dark night with a NMI parity error, cruelest fate!

One evening he arrived at his home address just as dusk seeped into the foreground screen, and the sun sank into background. He pulled his Super-Debug into the driveway (he had missed the 5100 bus that morning), and dumped his clusters onto the hard concrete disk of the patio. "Oh, God," he sighed, "they don't make Brown Bags like they used to!" He tidied the mess with an ARC file and swept up the remaining sectors with a Check-Disk.

Suddenly he became aware of being watched from the other side of the driveway. Indeed, somebody was standing there with a wane smile on her monitor. "Wow! What an elegant piece of liveware!" She seemed very interested in him as though waiting for a greeting. "What a great configuration! Mostly soft ware it counted, firm ware it should be firm," he thought. "Am I getting lucky?"

Angeline was her name and she was a dish! Eyes of black Cobol, lips like a red Lotus flower, hair flowing like a Symphony of highlighted cursors, a luscious Framework of delight, and a petite foot-print. Manny's peripherals came to life, reaching out for infinite connectivity and networking. He plucked a daisy wheel from the border and, as he turned to

continued on page 315

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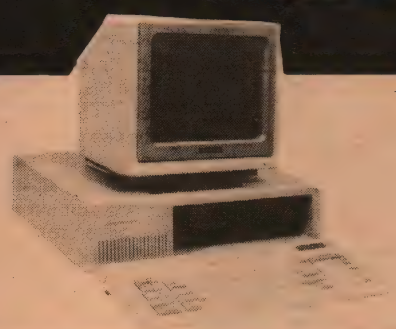

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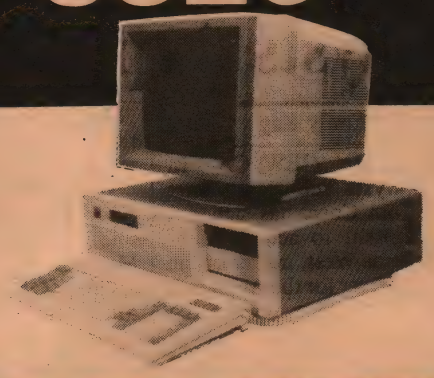

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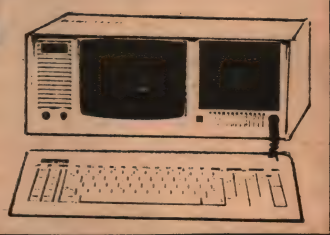

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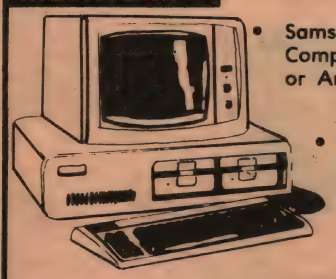

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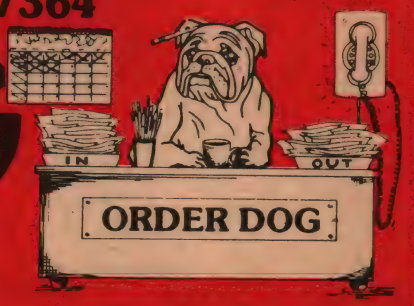

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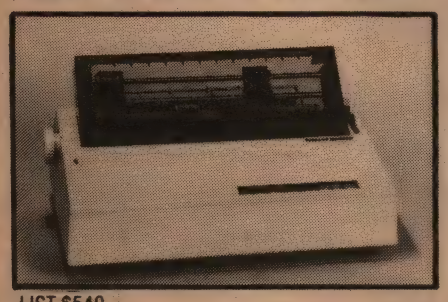

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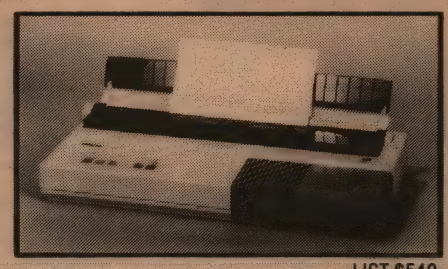

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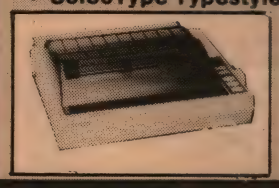

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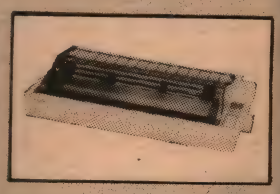

The New Epson FX-286E Printer is a 136 column, 9 wire printer that prints at a fast 240 cps in draft mode and 48 cps in Near Letter Quality Mode to save you time and increase productivity. You also get quicker access to your computer with it's built-in 8K printer buffer. The FX-286E features unique single stroke selection of numerous typestyles through Epson's exclusive SelecType feature. Friction feed, tractor feed and built-in parallel interface are standard, as well as unique new features such as Double High Characters, standard Sans Serif Font and Automatic Single Sheet Loading. The new FX-286E also has dual identity; Epson Standard Code for Printers (ESC/P) and IBM Proprinter XL emulation, and both modes are dip switch selectable for compatibility with a wide variety of software applications. You can even print those complicated graphs and charts with the FX-286E's graphic capabilities and the downloadable IBM character sets. The FX-286E accepts optional accessories such as single cut sheet feeder, 32K buffer, and Serial interface boards. Get a hard working business printer designed to give you a powerful advantage in meeting the hectic, high pressure demands of today's business world...get the the EPSON FX-286E.

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The new Epson LX-86 is perfect for the vast majority of your personal and professional printing needs, such as reports, term papers, recipe files or mailing lists. It's easy to set up and operate. And, with Epson's convenient SelecType feature, you can choose from a wide range of typestyles and graphics. With convenient Dual Mode operaton, the LX-86 lets you zip through drafts at high speed, or produce finished copies with a high-quality, typewriter-style appearance. And it accepts a complete line of options for easy, future expansion. Because the LX-86 is made by Epson – the standard of the industry – it's compatible with virtually every computer system made. It inherits a reputation for dependability and durability that's unsurpassed by any other brand. And it offers a full one year warranty. The new Spectrum LX-86 offers a combination of performance and value at a price that's second to none.

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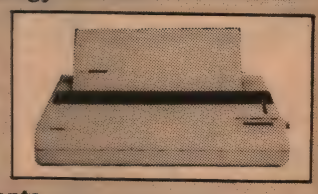
EPSON LQ-2500

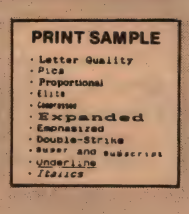


- Ultra High Speed Mode at 405 cps
- Letter Quality Mode at 108 cps
- SelectType III Memory Cells
- Five Resident, Letter Quality Fonts
- Optional User-Installable Color Kit
- Both Parallel and Serial Interfaces
- Prints Bi-Directionally in Text & Graphics

Loaded with innovative technology, the LQ-2500 is designed to cover a wide range of printing tasks. It offers high-speed and dot matrix versatility with true letter quality printing at the touch of a button. For optimum versatility, the SelecType III panel with its 20-character LCD prompts, confirms and stores print modes and print settings through the use of macros. Instant, one-touch selection allows a choice of five letter quality fonts residing in memory. The LQ-2500 has both parallel and serial interfaces making it compatible with virtually every personal computer. The built-in ESC/P Extended IBM-style graphics Character Sets assures compatibility with software written for the IBM PC. It's 8K internal buffer stores four pages of data while you continue to use your computer – a real time saver. And to back our commitment to total value and customer satisfaction, a one year warranty stands behind the Epson LQ-2500 from MidWest Micro.

EPSON LQ-800 & LQ-1000

Best Prices And Support On Epson Printers In USA!



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- 7K Internal Print Buffer
- One Year Warranty
- 24 Pin Head, 180 cps
- Superb Letter Quality Resolution

The EPSON LQ-800 and LQ-1000 can print at a speedy 180 cps in the high speed draft mode. A speed fast enough to put a typical length business letter in your hands in under 25 seconds. Or for that finished, professional look, switch to the Letter Quality mode at 60 cps. The results will amaze you! Espon's advanced 24 pin print head assures superb resolution page after page. Whether you take it home, use it to help run a small to medium size business, or use it in the corporate environment, the LQ Series makes an excellent choice. And easily installed identity modules let you choose between Extended Epson Graphics, IBM Graphics printer, or Diablo 630 Code. The kind of versatility a growing business demands.

EPSON EX-800 & EX-1000

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- Fast 300 CPS Draft Mode
- Bi-Directional in Text and Graphics
- Optional Color Kit Available
- Built-In Push Tractor Feed

The EPSON EX-800 and EX-1000 is specially designed to handle corporate and small business printing needs easily and efficiently. They print at a speedy 300 cps in draft mode or switch to the near-letter-quality mode for that professional look. The new push button SelecType II font control panel lets you choose from a combination of eight different typestyles. And there is even a user-installable color option kit that adds seven vibrant colors to your text and graphics. The EX Series also provides a built-in push tractor feed that facilitates paper loading and allows short paper tear-off. And as with all Epson printers from MidWest Micro, you get a Full One Year Warranty. Whether you use a printer at home, small business, or the corporate environment, the EX Series makes an excellent choice for virtually all printing tasks.

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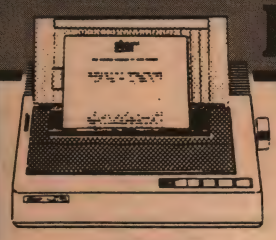

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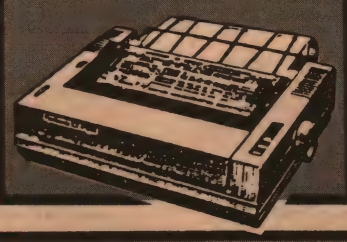

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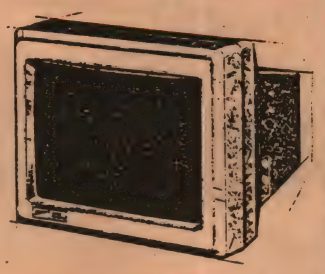

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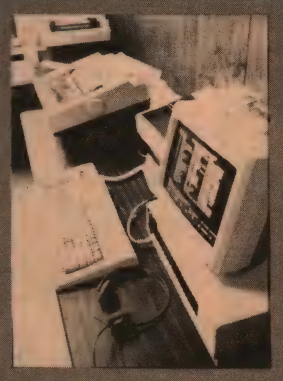

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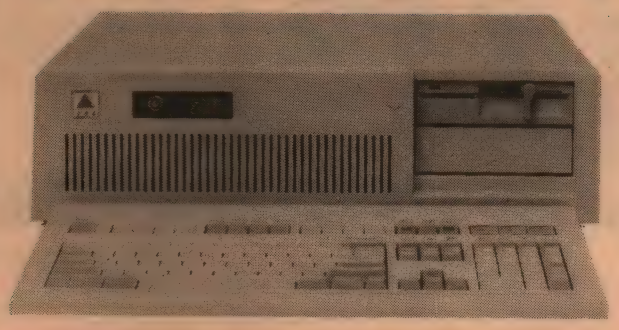

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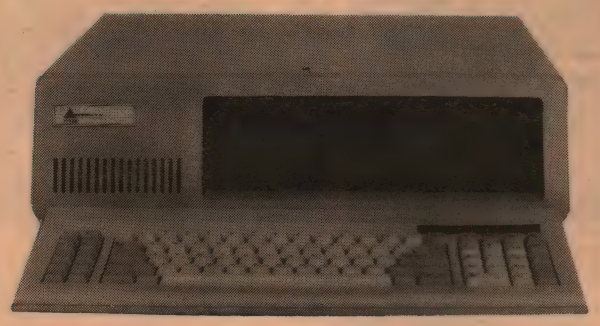

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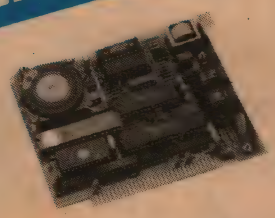

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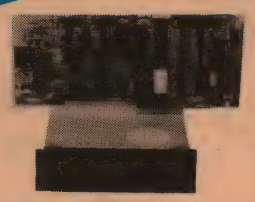

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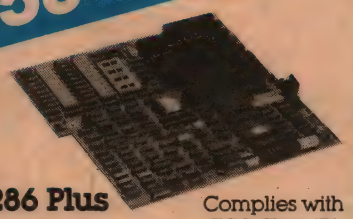

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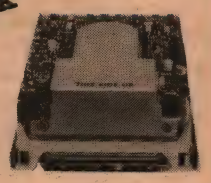

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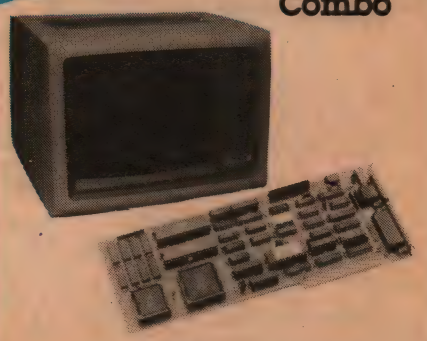

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A LAN Primer continued from page 5

Conversion (i.e. how is the date represented here, time, character sets, etc).

Session: How are services initiated and set up? What procedures must be executed to get services?

Transport: Reliable end-to-end communications Network How do things get around the network?

Data link: What is the communications protocol used?

Physical link: What communications hardware is used?

The Data link and Physical links are usually implemented in hardware, while the rest of the layers are implemented in software.

In general, the hardware layers are the ones that contribute most to the speed of a network (speed on networks is measured in megabits-per-second). There are quite a number of manufacturers that produce various hardware networking equipment. The capabilities of this hardware varies greatly due to differences in operating speed (usually measured in megabits-per-second), access method (the set of rules that determines how data is to be sent over the net, such as who can transmit and when), and physical architecture.

Some of the network access methods discussed here have been adopted as standards by the IEEE, a professional oraganization of engineers. These will be referred to by their IEEE document number as well as by other popular names. All computers on networks, whether they are servers or workstations, will be referred to as nodes.

The most common (as well as the oldest) LAN protocol is usually referred to as Ethernet (a registered trademark of Xerox). Ethernet, also known as 802.3 is based upon an access method called CSMA (Carrier Sense Multiple Access). The principle is simple: every node on the network is connected to a single cable. When a node wishes to transmit its requests, it listens to the cable for other conversations; if it hears none, it transmits, otherwise it waits and listens some more. If the node was able to transmit, it listens for other conversations, assuming no other nodes tried to transmit at the same time, the node assumes it has completed its transmission. If at any time during its transmission a node hears another node's transmission, a collision is said to occur and the node must retry the transmission. There is considerable overhead involved with retries.

There are two variations of CSMA. One is referred to as CSMA/CD. The CD stands for Collision Detection. CSMA/-CD means that when a collision is detected the node that detected the collision will attempt to retransmit at the completion of the current transmission. The other popular variation is CSMA/CA. The CA stands for Collision Avoidance. Under this scheme the node that detects a collision will perform some predesignated unique calculation (such as counting up to its node number times 3) before attempting to retransmit. The idea is that each node will wait a different amount of time before it retransmits.

Another popular networking protocol is ARCnet (ARCnet is a trademark of Datapoint), also known as IEEE 802.4. ARCnet uses similar media to Ethernet but each node may only transmit in order. Order is determined by the passing of a token. A token is merely a unique piece of data that, when received, is a signal that a particular node may transmit.

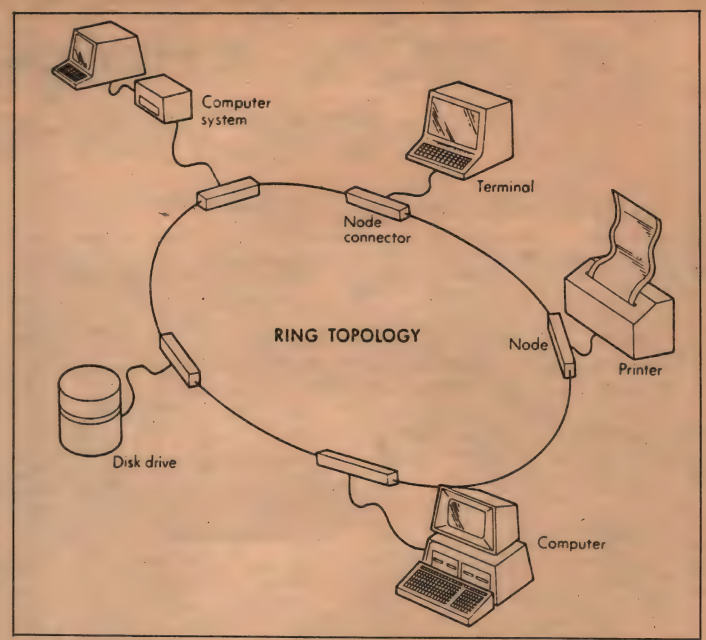
The protocol that everyone seems to be talking about is the IBM Token Ring. This protocol, also known as IEEE 802.5, is a point to point transmission. Each node receives the signal and retransmits it. If a node wishes to transmit, it waits for a token to arrive. As long as the token that arrives is free (i.e. has no data already attached), the node may transmit.

Another protocol worth noting is Proteon's proprietary Pronet 3 protocol. Similar in concept to IBM's Token Ring, the Proteon protocol provides much improved performance by allowing tokens to carry more than one node's data at a time.

Most of these protocols have a few more variables than have been discussed. While these explanations are quite general and oversimplified, they should provide the essence of how each protocol operates.

One additional point that will be noted here, but not discussed in any depth (more for the vocabulary than for the technical definition), is that some networking schemes allow more than one "channel" or conversation over the net. Networks that allow this are called broadband networks as opposed to baseband networks (which only allow single channel transmissions). Band width determines how much data can flow over a network at any given time.

Data flows through networks in units called packets. Packet sizes vary from network to network. Packets usually contain data and some information as to where the packet came from, and where the packet should go to (also known as routing information). Routing information is most often appended to the data, and referred to as a packet "header." These packets are a convenient, and manageable unit of data for the network to handle. Anytime a node wants to send a unit of information larger than a single packet (for instance, a 64K file), the network software breaks it up into packets. These packets are reassembled by the network software at the other end.



Networks are often classified by their topology. Topology usually refers to the method by which the nodes are connected within the network itself. Nodes may be wired in a straight line to a common cable (typical of Ethernet). This is referred to as a BUS topology. Nodes may be wired together in a Ring or a Star (all the network cables radiate out from a central point to the nodes), or Hierarchical network. Each LAN manufacturer has specific recommendations which topology best suits their LAN.

The above taste of network jargon and theory should come in handy in exploring what network hardware and software exists on the market today. Finding suitable network software is probably a good place to start. This is justified by the fact that most companies have some preconceived notions of what their LAN will be used for. The software should be able to support their applications.

Novell's Netware and Advanced Netware family of operating systems are perhaps the most popular in the microcomputer LAN market. The Netware and Advanced Netware products offer file, print, and communications (including electronic mail) services to workstations running MSDOS (or PCDOS). Novell's products also offer a flexible and powerful security system to protect data from unauthorized usage or tampering. Novell also offers record and file locking for multi-user access to files. There are 4, however, two features of Novell's products that outshine all the others. The first is speed. Netware is a special operating system, built from the ground up, intended to be used as a network operating system. This operating system has been designed with no other purpose in mind, and is optimized as such (in other words: it's fast!). The second of Novell's best features is that it can be run on a very wide variety of LAN hardware. The list of IBM's PC Network, Proteon's Pronet, Corvus Omninet, Standard Microsystem's ARCnet, Orchid Technology's PCNET, Gateway's G-NET, and AT&T's StarLAN is not even an exhaustive list. That should give the reader some idea of it's flexibility.

One of Novell's chief competitors is a company called 3Com. They make a rather high performance network operating system called 3+. 3+ has most of the features found under Netware. However, as far as 3Com's local reps could tell me, it only runs on 3Com or 3Com compatible hardware. Banyan makes a product called VINES, also known as Virtual Networking System. VINES provides a distributed networking operating system. In addition to providing all the file services, print services, and communications services (including electronic mail) found in Novell's product offerings, VINES provides many advanced communications features and a naming service. VINES allows the connection of distant LANs via a variety of synchronous and asynchronous protocols, a unique and very useful feature. VINES also allows connection to IBM mainframes via 3270 emulation, and connection to other machines via asynchronous lines. The naming service allows for location independent reference to services on the network. This means that a printer located on a specific server in a network can be referred to by a name rather than a location, and if the printer is moved to another server, the name does not need

continued on page 314

Proteon's Networking continued from page 12

allows server-to-server communications over several different media types. This server-to-server capability may be utilized over standard telephone lines to provide interconnection of LANs in distant cities. VINES communications facilities provide services for both synchronous (occurring at the same time) and asynchronous links, as well as dial-in and dial-out capabilities. VINES also provides NetBIOS and 3270 emulation capabilities.

For other applications, especially those involving communications with minicomputers, mainframes and microcomputers (or generally among dissimilar machines), Proteon provides a family of TCP/IP programs and drivers. There is one available for almost every machine supported by Proteon hardware. TCP/IP provides for file transfer, terminal emulation, and various other services over the network.

Proteon's line can be used to solve any networking problem, large or small, with almost any type of machine, in any type of environment, over any distance. With all this performance, capability and utility, why has Proteon kept such a low profile?

Proteon has always been a research-and-development-oriented company, and did little in the way of marketing and public relations. Networking experts always knew where to get Proteon products. As the microcomputer industry has grown up, networks have become more popular, and even non-experts have a need for the technology. Realizing this, Proteon has expanded its marketing efforts. Now even the non-experts know where to get the best networking products.

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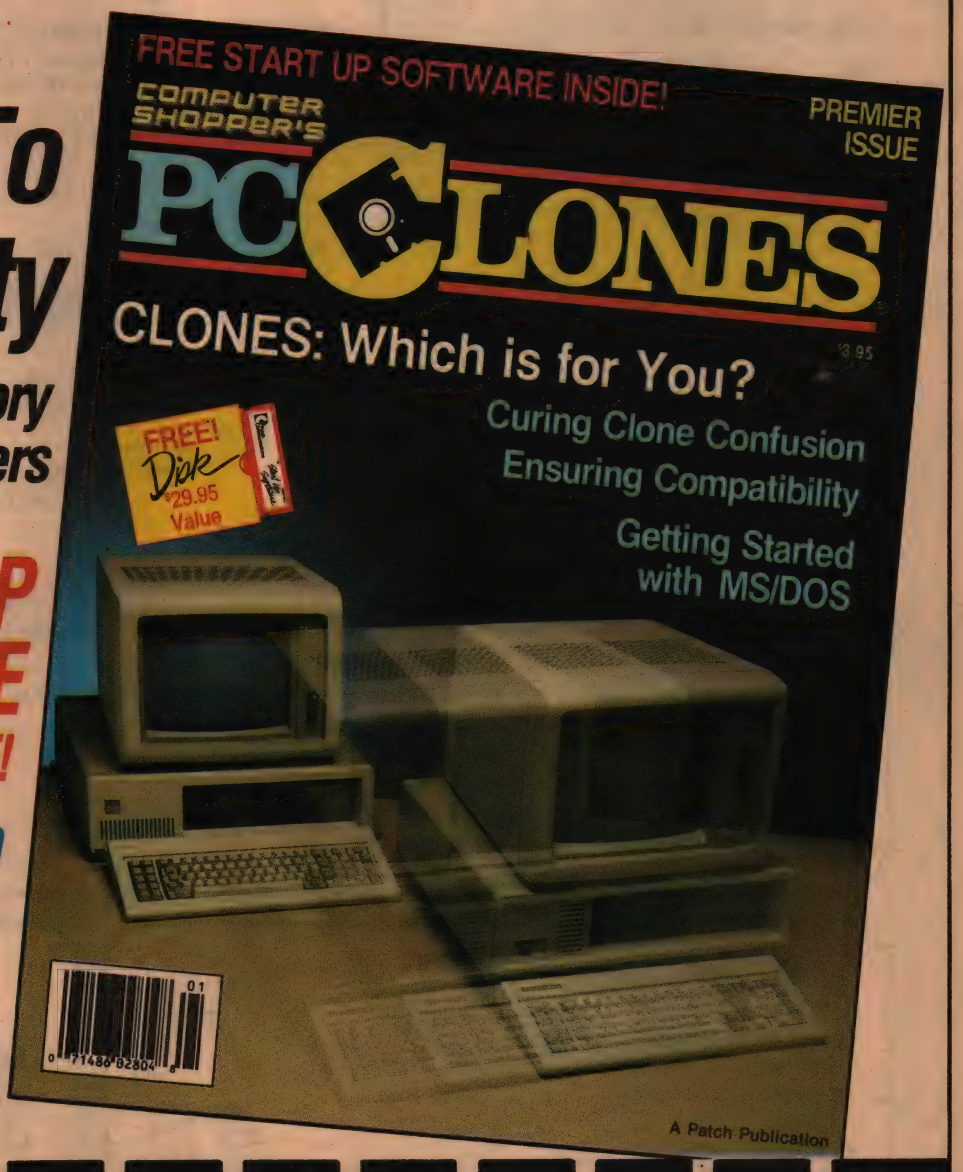

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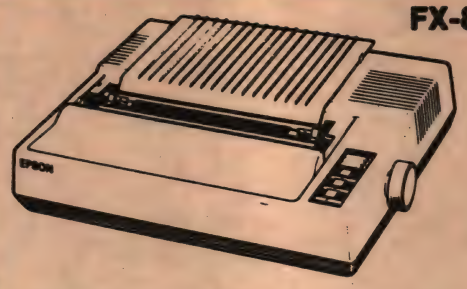

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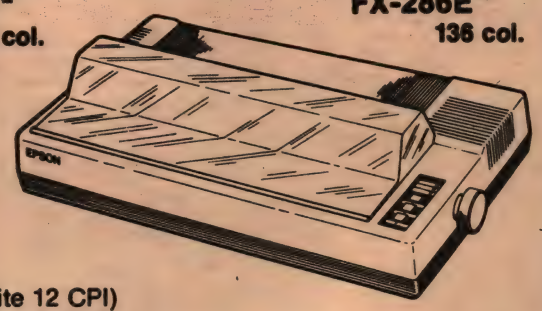

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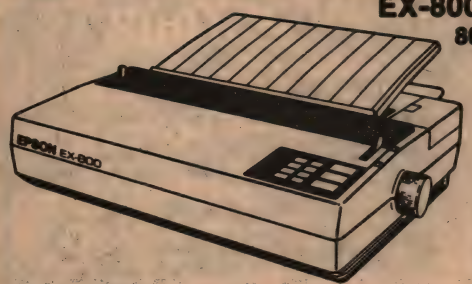
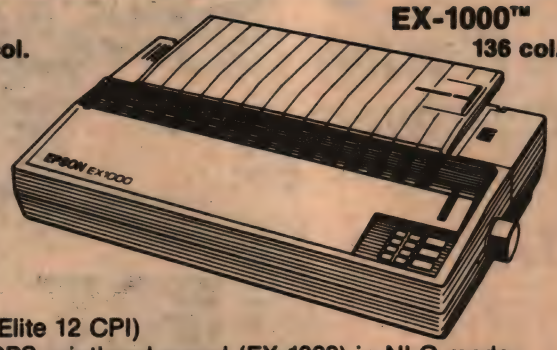
EX-800™ 80 col.



EX-1000™ 136 col.



- 300 CPS printhead speed in draft mode (Elite 12 CPI)
- 54 CPS printhead speed (EX-800) or 60 CPS printhead speed (EX-1000) in NLQ mode
- Push button front control panel for 8 different typestyles
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- Built in tractor feed
- Color Option Kit adds color to text and graphics

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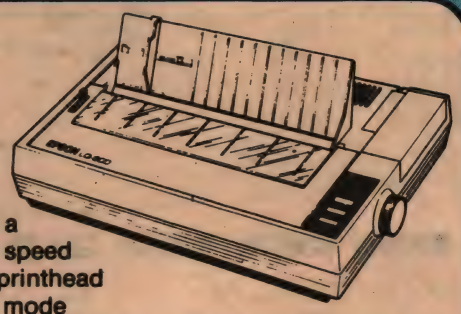

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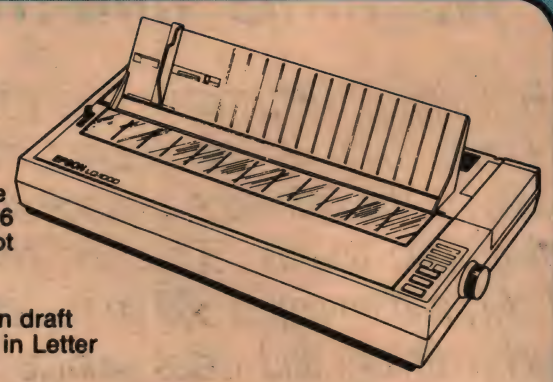

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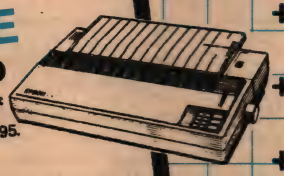

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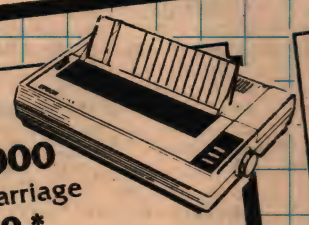

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Hard disk Backup Utilities (3109): Better safe than sorry. This has several hard disk backup programs
MasterKey (3110): Like Norton Utilities, only better!
PAL 1.4 (3209): This program makes Sidekick even more powerful. (requires SideKick)
Blaque Book 2.0 (3210): Helps you keep track of names and addresses
Personal Datebook (3211): Another appointment calendar program
Batch File Utilities (3303): Add new features to batch files
Z80MU 3.1 (3438): Run Z80 programs under PC DOS
EGAutilities (3439): Palette-setting, 43 line mode pitches, NANSI.SYS **Commando (3440):** DOS file handler. Can manipulate squeezed files and files in .LBR format
Print-To-Disk (3441): This disk has 12 different programs that print to disk. Some have source code.
Disk drive utilities (3442): Includes a RAM disk, a cache program, a fast format program, and more
Utilities for advanced users (3443): with technical information
EGA demos (3444): Show off the capabilities of your EGA board and monitor with this demo program
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Eagleterm (6031) A popular communications program.
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Terminal.Hayes (6085) Terminal program to use with a Hayes modem.
Saturn Terminal (6112) Communications program with Rainbow protocols. Has up/down loading capabilities.

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Bairstownth.c2 (6028) Commodore's Educational Software provides a great tutorial for teaching polynomials. Student and Teacher instructions included.
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Monopoly (6059) Still as exciting as ever! (many other games on this disk, and music, too.)
Supertrek (6079) An exciting space exploration game.
Black Jack (6090) Play Blackjack against your computer.
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Light Cycles (6103) Force your opponent to crash while he does the same to you!
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Over the Rainbow(6101) And other songs are on this disk.
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Minuet in G (6116) is among the many songs on this disk.
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C64 COMAL (6036) More demonstration programs in COMAL.
C64 COMAL (6037) Still more demonstration programs in COMAL.
Ref Guide (6046) Programs from the C64 Programmer's Reference Guide and the User's Guide.
Ponzo Tutor (6063) 6510 machine language monitor tutorial.
Ponzo Tutor (6065) More 6510 tutorials.
Sprites (6066) Tutorial programs for sprites.

UTILITY PROGRAMS

Hex Dump (6027) Dumps any file to the screen in hexadecimal.
Cockroach (6034) All four of the Cockroach utility programs are on this disk, along with others.
Scrclr.asm (6040) A disk full of demonstration programs.
Seqfileread (6042) Use this program to read sequential files; other utilities are included on this disk.
Paddle Test(6089) Testing the function of your paddles is only one of the utilities on this disk.
1541 Backup (6091) Backup those important disks with this easy to use backup program.
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Disk Doctor (6114) Fix disk problems with this handy program. Printer and other utilities on this disk.

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8015) MINN-AID: Minnesota Agricultural Experiment Station & Extension Service Software. 14 ag related programs includes BestCrop, FertMix, FoodCost, FarmBid, TaxFill, and more.

Charts & Graphics

8019) SOFTGRAPH: Business graphics program. Creates line, bar, and pie charts.

Database Managers

8020) & 8021) & 8022) PDS*BASE DATA BASE SYSTEM: Hierarchial type of relational data base generation system. Generates BASIC programs to run a random access hierarchial data base of up to 10 data base files. Manual consists of text files to be printed with Apple Writer II. Manual is on the disks 8021 & 8022. (Shareware) **(3 disk set. Must order all 3 disks)**

8023) FILES 1.0: A Database Management Program. Complete instructions are given on the use of this database. Able to create, retrieve, append, update, delete, insert, copy, search, sort, and merge. Also includes debugging information. (Shareware)

8024) OMNIFILE: Version 3.0. File Management program that creates, adds, inserts, sorts, deletes, and merges. Can modify structure of file at any time. Includes built in data analysis and report generation. (Shareware)

8025) FILE CABINET I-IV: Four versions of a simple data base that holds about 2000 records.

Spreadsheets

8040) BASICALC: Applesoft Spreadsheet compatible with some Visicalc files.

EDUCATION

Astronomy

8100) CONSTELLATION and ASTRO CONVERSION: Plots stars of the brightest constellations in the northern hemisphere. Also converts right ascension & declination coordinates to altitude & azimuth and back.

Aviation

8105) AIRCRAFT DATABASE: Database of many types of aircraft divided into 6 categories. Uses File Cabinet IV as the data base.

8106) AIRCRAFT SLIDE SHOW: Hi res pictures of many different aircraft. Also includes AIRCRAFT PERFORMANCE program to calculate flight characteristics of homebuilt aircraft.

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8109) CALORIE COUNTING PROGRAM: Also includes LIFE EXPECTANCY and RECIPE BOX data base.

Electronics & Radio

8110) MORSE CODE disk: 17 programs designed to teach and develop Morse Code skills.

8111) DXCC DEMATTIA: 5-Band DXCC record keeper and other programs with DXCC information that can be retrieved and used.

8112) LOG BOOK 1.1: Amateur radio log book with instructions. Also includes other log keeping and directory programs and lists of other ham operators.

8113) Electronic Calculations Disk: Contains programs to calculate formulas for A.C circuits, pi networks, antenna designs, and more.

8114) LOGIC ANALYZER: Program to input and analyze circuits with up to 63 gates and 255 nodes. Also includes other analysis programs.

Language

8120) GRAMMAR QUEST][: A game written in Apple Pilot that teaches proper grammar usage.

Miscellaneous

8180) CLASS RECORDS: Version 2.0. A Grading System for secondary school and college instructors. (Shareware)

8181) PILOT->BASIC: Converts a series of Pilot commands into BASIC programs.

GAMES

Adventure

8290) ADVENTURE: Explore a cave and a castle, and meet a wizard and a dragon.

8291) ADVENTURE III: Apple][version of Colossal Cave originally created by Don Woods and Willy Crowther at M.I.T.

8292) STAR WARS: Escape from the Death Star. Also includes another version of Wood's and Crowther's Adventure.

Eamon Adventures

8201) MAIN HALL and THE BEGINNER'S CAVE: Version 4. Create a character to explore the Cave or go on to the other adventures. This disk is needed to run the other Eamon adventures.

8202) THE LAIR OF THE MINOTAUR: Escape from the Lair of the Minotaur.

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8230) THE UNDERGROUND CITY: Find your way back to your own world. For Advanced Players.

8257) MANXOME FOE: You are mysteriously kidnaped.

Eamon Tournaments

8280) THE CASTLE OF COUNT FUEY: You have an hour and a half to remove the Baron's possessions from the castle. Does not require Main Hall disk.

8281) THE SEARCH FOR THE KEY: Find the key required to rescue the King's officials. Does not require Main Hall disk.

Arcade

8330) ATTACK OF THE KILLER MUTANT JELLYFISH: Destroy the jellyfish before they destroy the Earth. Joystick required. (Shareware)

GRAPHICS

8350) TOM"S TOOL KIT: High Res Character Generator that creates DOS Toolkit character sets. Includes instructions.

8351) HI-RES DOODLE: High res color drawing program that uses the keyboard. (Shareware)

8361) SPARKEE: High res graphic pattern generator with sound, controlled by the keyboard. Written using the Ceemac Language System.

HOME

8430) VIDEO LIBRARIAN: Version 1.0. Data base to organize a video cassette library. Search on number, title, type, and rating. (Shareware)

MUSIC

8450) MUSIC MAKER: Version 1.0. Program for entering, editing, and playing back music. (Shareware)

PROGRAMMING

Tutorials

8550) Microlab Apple Tutorial Disk: Detailed Applesoft BASIC tutorial

8551) BASIC PROGRAMMING: Integer BASIC tutorial

8552) DISK AIDE: Hints and ideas on editing a program

Assembly Language

8555) MASMA: Simple editor and assembler with documentation. Also includes a mini-assembler and tutorials.

Forth

8570) FIG-Fourth78: Release 1.0. Apple version includes tutorial.

RELIGIOUS

8600) GRAPE Music: Gospel Resource And Program Exchange. Plays single voice music. Includes Note Speller note reading game.

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8700) DIVERSI-DOS: Replaces DOS 3.3 for faster loading, saving, reading, writing and more. Includes keyboard and printer buffer software that uses a RAM card. (Shareware)

8701) FILE DISK CATALOG: Version 2.0. Disk library data base that reads disk catalogs or allows manual input. Searches and sorts by selected fields.

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8720) PRINTER POKER: Downloads custom fonts to an Apple DMP or ImageWriter printer. (Shareware)

8721) Epson Utilities: Utilities for printing labels, interfacing with AppleWriter I, and control codes for MX-80.

8722) EPSON HIRES DUMP: Prints Hi-Res graphics from the screen to an Epson printer.

Miscellaneous

8730) & 8731) ED'S PLOT PACKAGE and DOCS: A 1 or 2 dimensional array plotting and generation system. Sample arrays and hi res pictures are included. Complete documentation is on the disk 8731. **(2 disk set. Must order both disks)**

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7006) DB HELP: Dbase help program listing all Dbase II commands and functions. (Requires Dbase II).

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7021) THE MINES OF MORIA: A complex fantasy game that changes every time you play it. (Requires MBASIC).

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7003) DDRAW: Version 2.0. Create pictures on your screen and save them on disk to recall later. This program also allows you to dump graphics to your printer. (Includes PASCAL source code).

7034) ARTIE: Version 6.0. An excellent graphics design program that allows you to dump your art files to your Okidata or Panasonic printers.

7053) & 7065) PLOT: Version 3.3. A very impressive high resolution plotting system for dot matrix printers. The plotting program comes preconfigured for Epson, C. Itoh, and Okidata printers. Source code is included. High level language facilities for creating the vector files are supplied for MBASIC, TURBO PASCAL and Microsoft FORTRAN80. Requires disk 7065. **(2 disk set. Must order both disks)**

HACKERS/SECURITIES

7005) DB SQZ6L: Take this program and encrypt your Dbase II command files to protect them from prying eyes. (Requires Dbase II).

7046) SCRAMBLE: Version 2.0. A very effective way to protect your files. This program scrambles your file using an eight character password. Even the author says he could not decypher without the password!!!

LANGUAGES

ALGOL

7040) ALGOL-M: An algol subset suitable for learning algol. Includes compiler and interpreter.

APL

7063) APL: Yes you read right ... APL. Don't know much about this program except that it appears to be bug free and supports standard APL.

ASSEMBLERS AND STUFF

7026) NEW ZASM: A Z80 macro assembler that assembles standard Z80 mnemonics into Intel hex format.

7027) ZMAC: A Zilog mnemonic assembler that generates relocatable object code. Also included is ZLINK a linkage editor for programs assembled by ZMAC. Generates native code.

7033) XLATE: Version 5.0. Xlate takes 8080 source code using Intel mnemonics and creates a new Z80 source code using Zilog mnemonics.

7042) DAZZLE STAR: Z80 disassembler with built in editor. The editor uses Wordstar compatible commands.

BASIC

7041) NBASIC: Nbasic is a basic preprocessor for Mbasic and Basica*. This preprocessor allows the programmer to use alphanumeric labels, REPEAT/UNTIL loops, case statements and fortran like subroutine calls.

C

7023) SMALL C COMPILER: Version 2.0. Expanded version of Ron Cains Small C. (Includes sample programs).

7024) SMALL C SOURCE: Version 2.0. Source code for C compiler. For those who want to modify a C compiler. (Requires 7023 to compile compile itself !).

7025) SMALL C MACRO FILES: Macro source files for Small C.

COBOL

7068) COBOL: Compiles to interpreted code. Includes interpreter and full documentation.

FORTH

7038) FORTH 83: 1983 standard forth interpreter.

LISP

7036) & 7070) ILISP: This is an implementation of LISP based on the LISP dialect called SCHEME.(Requires CP/m 2.*). **(2 disk set. Must order both disks)**

MODULA 2

7064) MODULA 2 SOURCE CODE: This disk contains fifty Modula source code files. Included are many useful utility procedures.

PRINTER UTILITIES

7022) FONTSY: Banner program for all printers. (Includes source).

7028) BRADFORD: An excellent near letter quality printer program for your Wordstar or standard text files. Comes with five fonts for Epson MX w/Graftex, IBM Dot Matrix, Star Gemini 10x/15x, and Epson FX/RX printers. A truly amazing program.

MISCELLANEOUS

7020) EXPERT SYSTEMS: Written in Pascal. (Requires PASCAL Compiler).

7039) DESK MASTER: A computer desk organizer. Desk Master comes with a calendar, card file, memowriter, and calculator.

7043) TOUR: Version 2.0. Document editor for outlining projects, also include desk calendar.

TELECOMMUNICATIONS

7004) DBBS: A space efficient dynamic bulletin board system that incorporates passwords. (Requires MBASIC).

7009) MBYE: Version 4.0. This is a remote console program for CP/M 80 computers. This disk contains assembly language source code only and is NOT for the novice programmer.

7010) & 7069) ROS: Version 3.4. Remote Operating System including PASCAL source code. Requires Turbo Pascal. **(2 disk set. Must order both disks)**

7069) ROS: Requires disk 7010.**(Disk 2 of 2).**

7011) ROSMAC: Set of machine dependent I/O and clock drivers for ROS V 3.3 and 3.4.

7018) MODEM 7: Powerful modem program that supports auto-dial for Signalman Anchor Mark XII, Hayes Smartmodem 300 or 1200, U.S. Robotics 300/1200 and PMMI 103 s-100 Plug-in.

7035) MEX: Version 1.11. Modem program that also incorporates a phone number librarian.

7054) & 7055) PBBS: A Small, very fast BBS program written in Z-80 assembly language. PBBS provides 8 level user profile,private and public message system, BYE504 or 339 bdos interface, automatic user/message automatic file maintenance. Plus more. **(2 disk set. Must order both disks)**

7058) & 7059) MBBS: A very powerful BBS. (Version 4.5). **(2 disk set. Must order both disks)**

7060) MBBS UTILITIES: Set of utility programs for MBBS.

7061) IMP: Version 2.44 Modem program that supports both KMD batch protocol in addition to MODEM7 type.

UTILITIES

7001) CPM POWER: Version 2.53. A CP/M subset with many additional commands.

7007) DB UTILITIES: Set of Dbase II utility programs and overlays. Includes source code.

7008) FBAD: Version 6.0. Checks your hard or floppy disk for bad tracks. Includes source.

7014) YANC: Version 2.4. Yet ANother Catalog program for those who attempt to keep themselves organized...

7016) MISC. STUFF: Contains XCCP, DASM, and I/O Cap.

7029) QUIKKEY: Version 2.0. Key redefinition utility.

7030) SUPERSUB: Version 1.3. Replaces SUBMIT on CP/M. Allows submit files and supports interactive mode.

7031) EPEX: Version 1.1. Evironmental Processing EXecutive. EPEX ia a very powerful environmental program with such features as batch processing including IF /ELSE /END /GOTO, named directories, aliases system control and much more. Includes full documentation.

7032) EPEX TOOLS: Tool package for EPEX V 1.1.

7037) EGUTIL: Set of CP/M utilities including free disk space by sector, file tagging, and hidden files.

7044) NEWARC: Set of archive tools written assembly language for increased speed. Tools include copy, add, del, directory, sort, and type. There is even a utility for running command files from the archive

7045) CRUNCH: Version 2.3. Utility for crunching and uncrunching files.

7047) FU-12: Full screen binary editor using commands patterned after Wordstar.

7050) SPOOLBUFFER: Throughs all output to the printer to disk file then from disk to printer for more efficient use of CPU time.

7051) CONIX: Conix is an operating system that operates under CP/M. Some of the capabilities of Conix include path searching, automatic overlay, redesigned user areas, 8M Print spooler, user definable function keys, virtual disk system, user definable I/O devices and much, much more. Conix is a must for any serious CP/M user.

7052) & 7071) CONIX DOCUMENTATION: Complete documentation for Conix. **(2 disk set. Must order both disks)**

7056) KMD: Version 1.5. Very popular file transfer program.

7057) LBRDISK: This set of programs fool BDOS into thinking that a library is actually a logged disk device.

7062) MAGIKEY+: A key redefinition program that allows you to create and keep key definition files.

7066) & 7067) FATCAT: Version 2.4. A catalog program that allow cataloging hard drives as well as floppy disks. Very easy to operate and configure. **(2 disk set. Must order both disks)**

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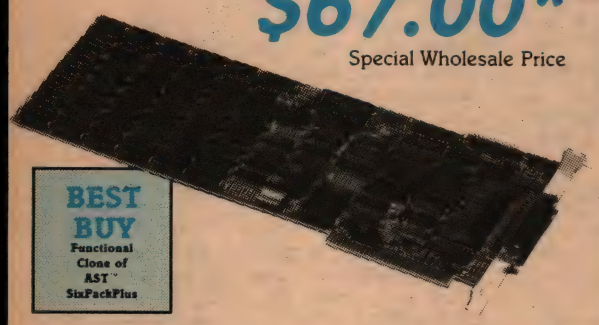

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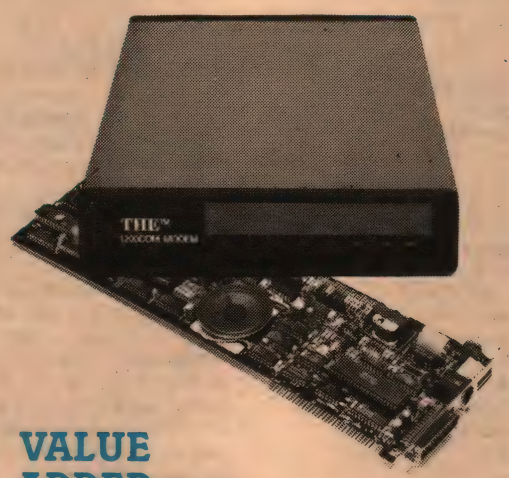

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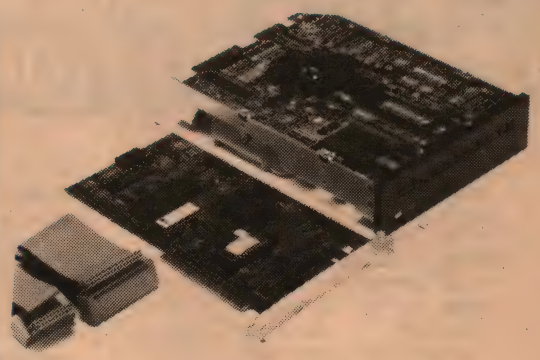

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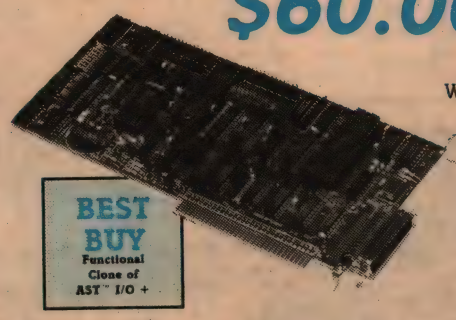

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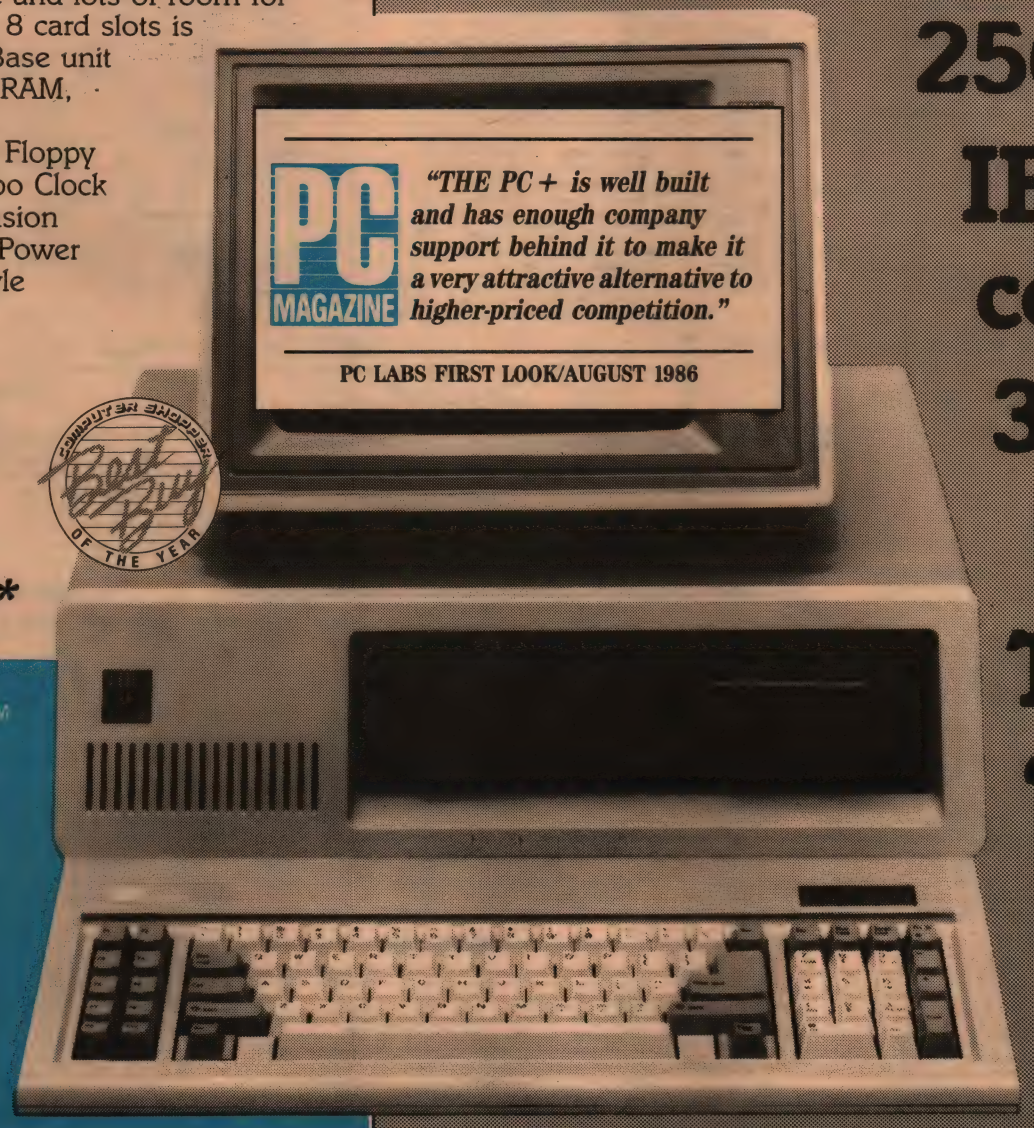
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Microsoft *Premium Softcard IIe*	243.67*	(2.50)
Microtek *Dumpling/GX*	55.00*	(2.50)
Orange Micro *Grappler +*	66.00*	(2.50)
Orange Micro *ProGrappler for IIGS*	68.75*	(2.50)
Orange Micro *Serial Grappler*	66.00*	(2.50)
Quadram *Multicore—1 Parallel 1 Serial/Clock Expandable to 256K*	140.00*	(2.50)
Titan Technologies *Accelerator IIe*	207.35*	(4.47)

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Hayes *Micromodem IIe w/Smartcom*	$125.00*	(2.50)
Hayes *Smartmodem 300 for IIc w/Cable*	150.00*	(3.24)
Hayes *Smartmodem 1200 for Mac w/Smartcom II and Cable*	417.00*	(9.00)
Hayes *Smartmodem 1200A*	282.00*	(6.09)
Prometheus *1200 A Low Cost 1200 Baud Internal Modem for Apple II.*	253.00*	(6.00)

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Curtis *Diamond Surge Protector*	$23.50*	(1.50)
Curtis *Ruby Surge Protector*	39.00*	(1.50)
Hayes *Mach III Joystick w/Fire Button for IIe*	30.25*	(1.50)
Hayes *Mach IV Joystick*	53.50*	(1.50)
Kensington *System Saver Fan*	63.00*	(1.50)
Kensington *Turbo Mouse*	77.00*	(1.50)
▶**Koala** *MacVision*	144.50*	(3.00)
Microsoft *Serial Mouse Ver. 6.0*	130.00*	(2.80)
Orange Micro *Rampack 512K of 4MB for IIGS*	175.00*	(3.78)
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PC Network *Macintosh Diskettes Includes Free Flip & File Case These Diskettes are Guaranteed for Life! No Generics!*	12.50*	(1.50)
PTI *Datashield S85*	45.00*	(1.50)
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Summagraphics *Mac Tablet (12x12)*	374.50*	(8.09)
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▶**IBM** *XT Professional Hard Disk*	1,337.00*	(28.88)
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Hayes *Smartmodem 1200*	340.00*	(5.00)
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Amdek *Color 600 High Res RGB*	365.00*	(7.88)
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Prometheus *Promodem 1200B*	225.00*	(2.50)
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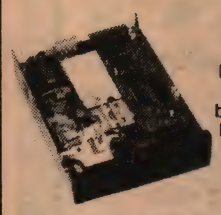

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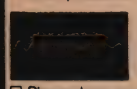
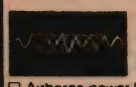
- ☐ Result from causes beyond utility's control
- ☐ Such interruptions often cause equipment damage and/or loss of processing data and memory if equipment is not protected



Brownouts

- ☐ Planned power reductions by utilities because of excessive demand
- ☐ When the voltage falls under minimum limits, self-protection devices will cause a shutdown

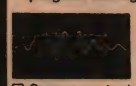


Electrical Noise
(Static, Interference)

- ☐ Airborne power line pollution induced by electromagnetic radiation or electrostatic coupling
- ☐ Caused by radio/TV broadcast transmissions, poor grounding, lightning, heavy equipment and utility network switching
- ☐ Results in spurious, erratic, erroneous operation; slow degradation of equipment components

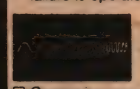
Voltage Transients
(Spikes, Glitches)

- ☐ Momentary high-frequency spikes on a 60 Hz voltage wave form
- ☐ Caused by brush-type motors in office equipment, improper grounding, lightning, etc.
- ☐ Results in erratic equipment operation via spurious command signals, negation of valid signals, memory loss, program damage, data errors, damage to components



Voltage Instability
(Surges, Flickers)

- ☐ Surges are high-level increases when large loads are suddenly disconnected
- ☐ Flickers occur when the power company switches substations because of lightning or other problems
- ☐ Caused by large loads such as air conditioners, elevators, etc., coming on-line
- ☐ All of these can result in sluggish or erroneous operation, failure to operate, memory lapses, damage to drive motors



Frequency Deviation

- ☐ Causes improper operation of computer timing and logic circuits

ANSI Standards

- ☐ Permits power sag at your entrance
- ☐ Allows additional drop due to intrabuilding impedances
- ☐ When these permissible drops coincide with an air conditioner or other heavy-duty equipment start-up, your power reliability is in jeopardy

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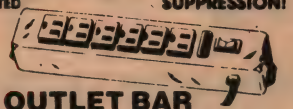

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add $15 shipping.

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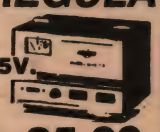

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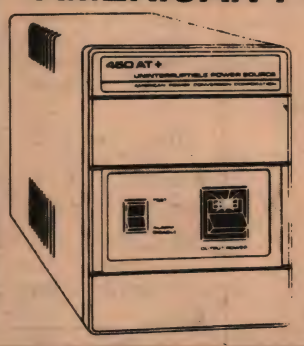

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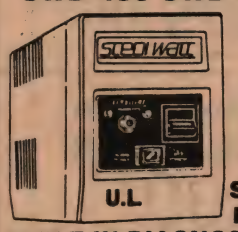

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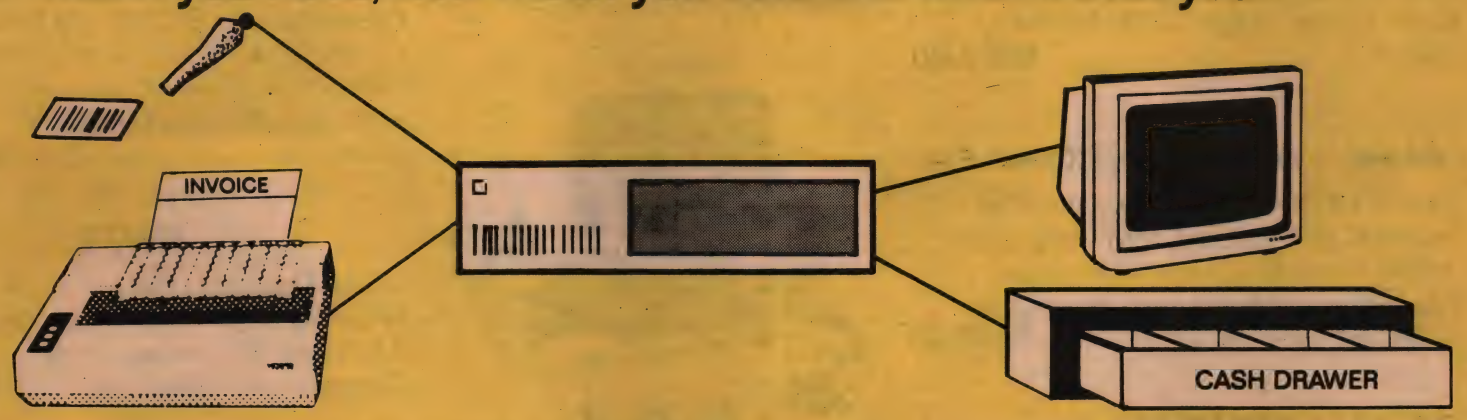

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BAR CODE READER WITH WAND		$485.00	
BAR CODE PRINTING SOFTWARE		$ 75.00	
CASH DRAWER		$385.00	
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		Tax, if applicable	
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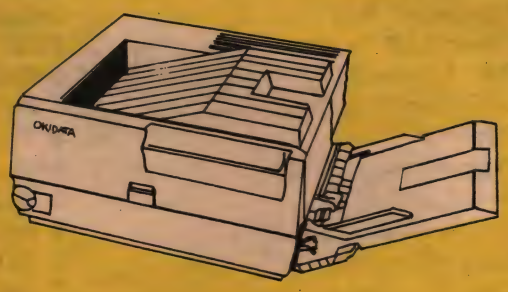

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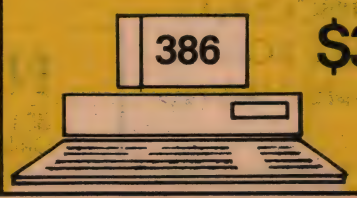

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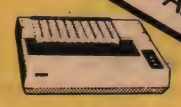

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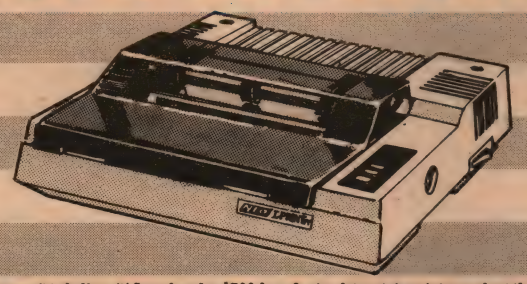

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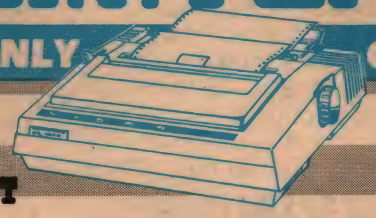

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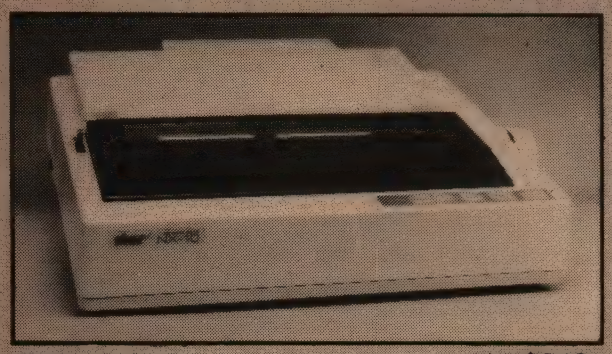

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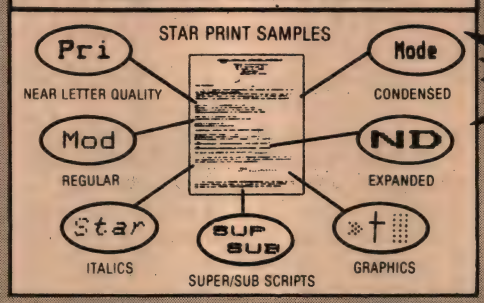

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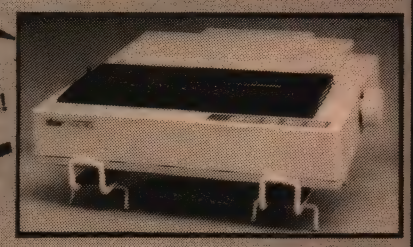

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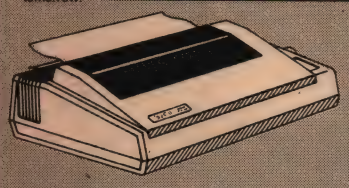

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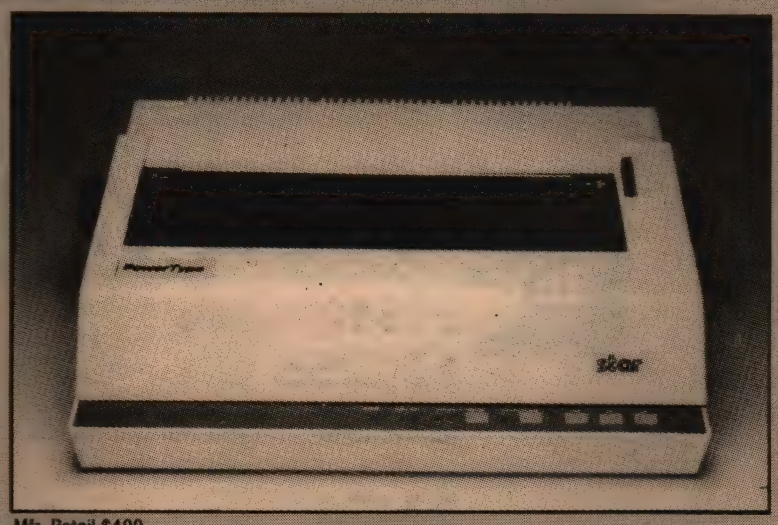

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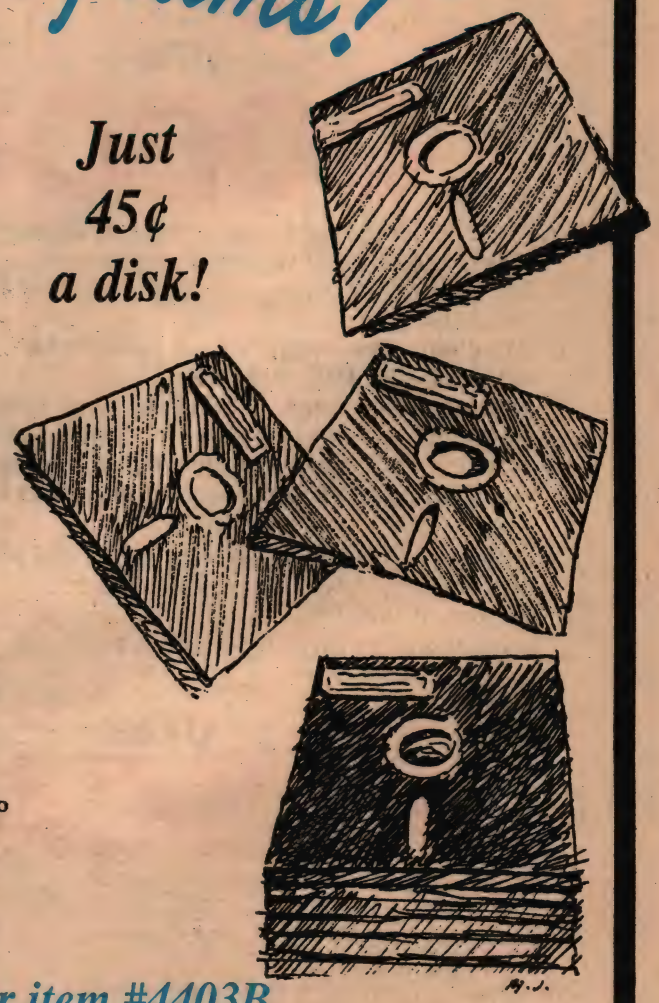

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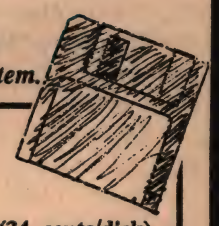

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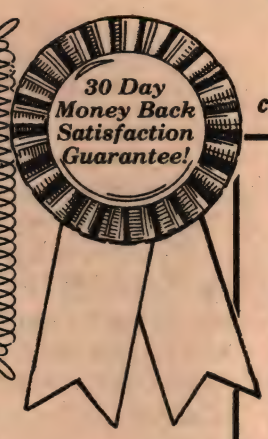

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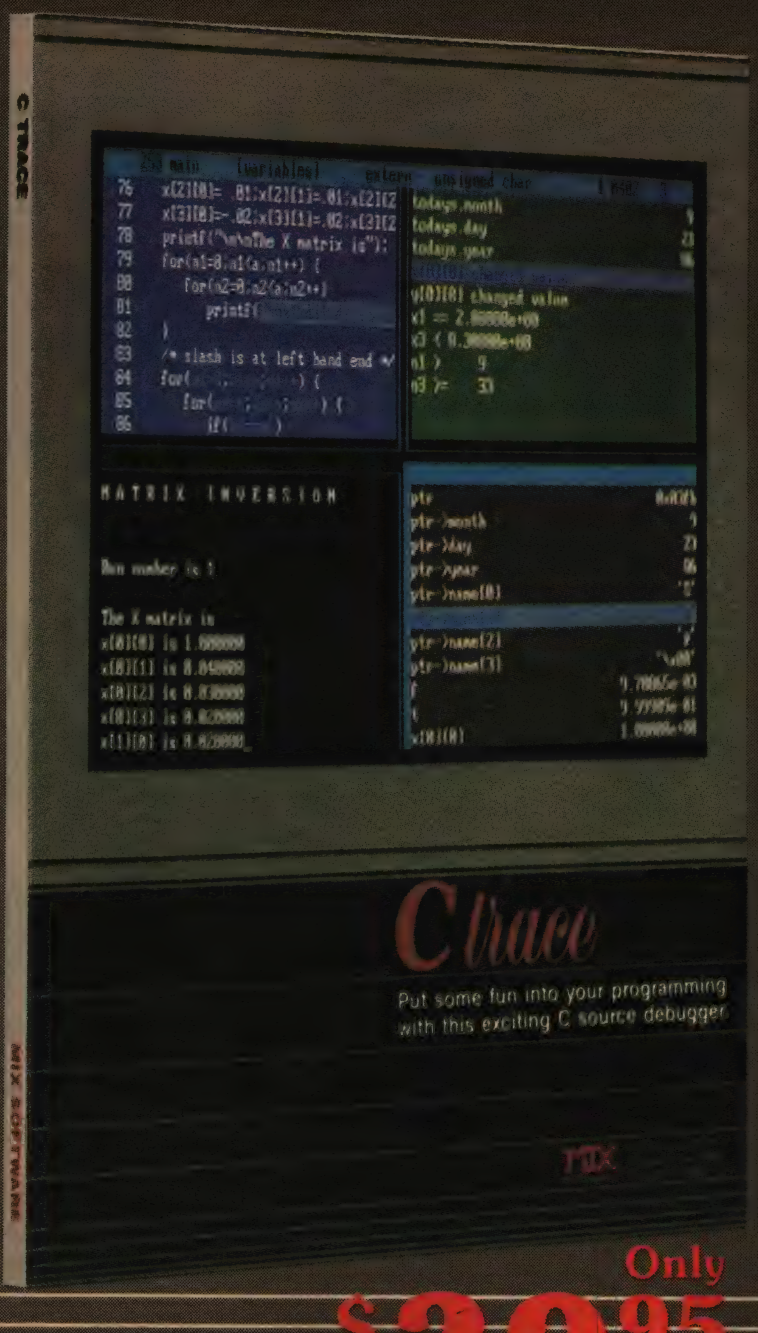

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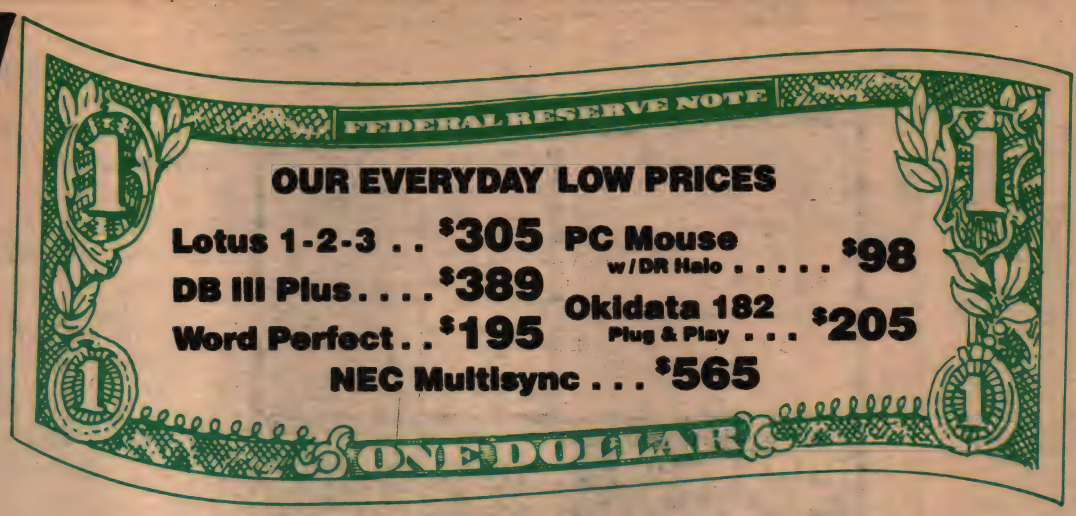
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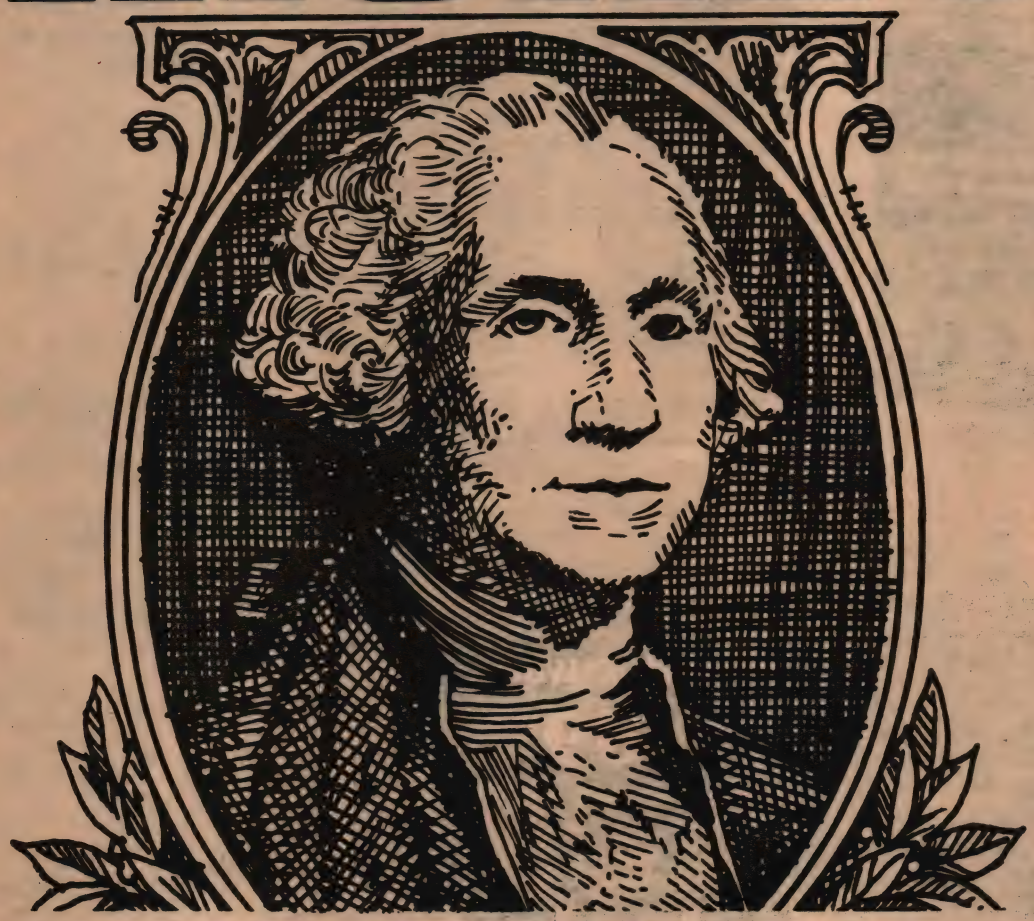

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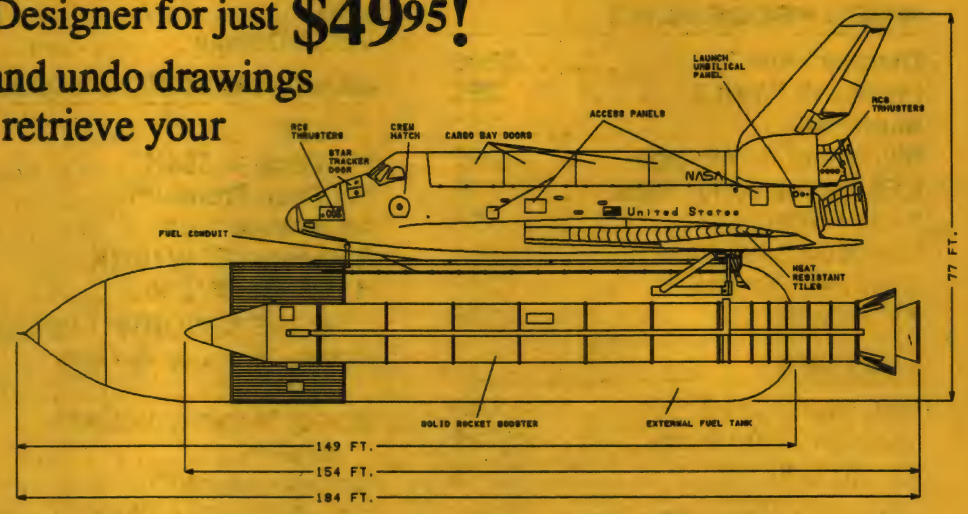

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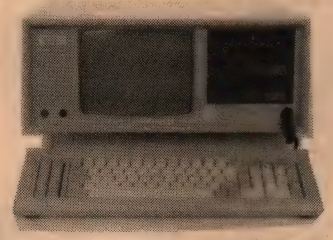

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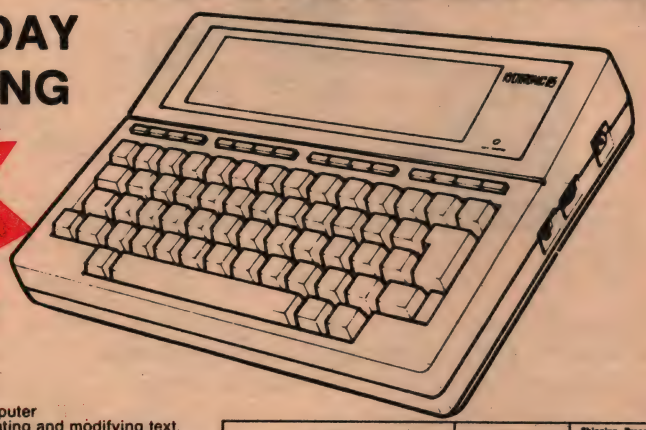

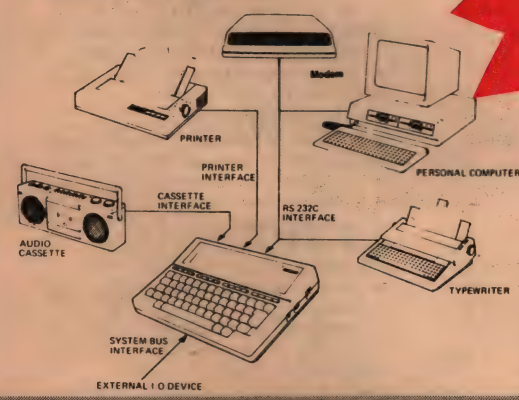

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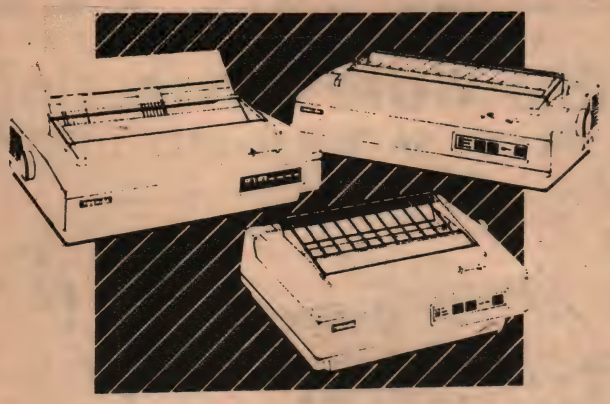

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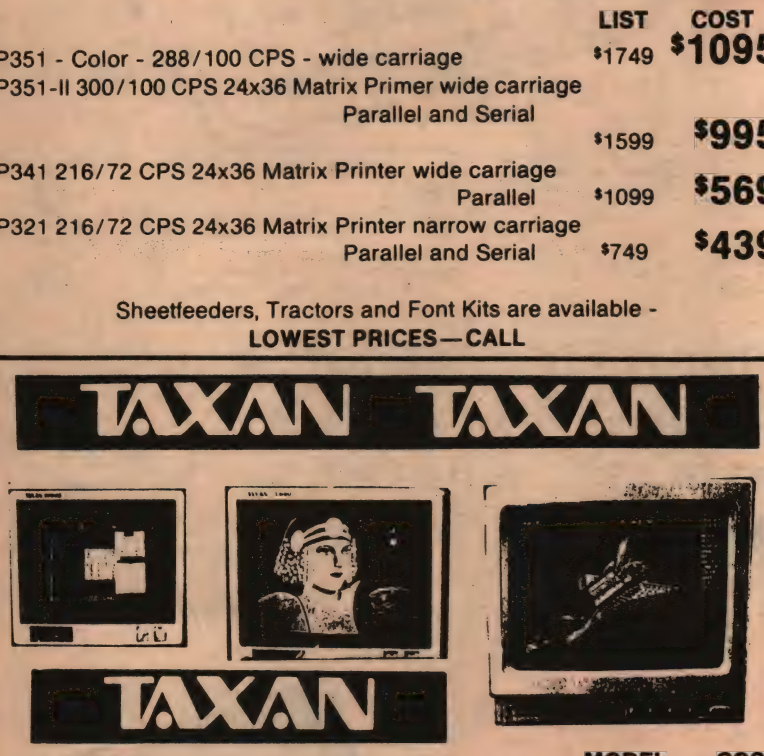

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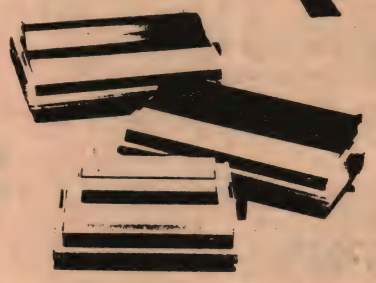

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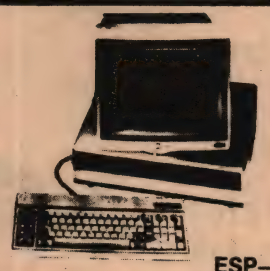

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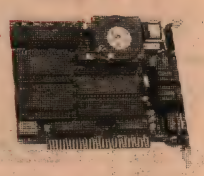

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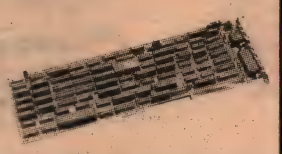
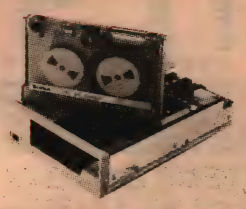
- MIO (serial and parallel) 2MB of RAM, 0K $148

- Mini I/O card (serial and parallel) $50
- Hard disk/Floppy controller $160
- Mono Adapter $89
- EVEREX Edge $215



TAPE DRIVES

	Int.	Ext.
20MB TEAC cassette	$580	$680
60MB Wangtek cartridge	$750	$850

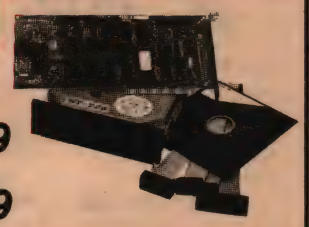


EGA COLOR CARD $199

80286 TURBO BOARD 0K $349

HARD DISK KITS

- 20MB Seagate ST225 with controller, cables, software, and Manuals $329
- 30MB Seagate ST238 ..... $379

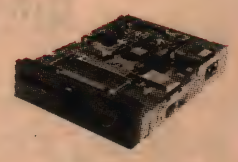


MONITORS

- High Resolution Mono monitor $95
- EGA Color, 14" monitor $450
- 14", High resolution Mono monitor ... $139

FLOPPY DRIVES

- Fujitsu 360KB $85
- Fujitsu 1.2MB $120
- TEAC 360K $99
- TEAC 1.2MB $135
- Beige Bezel $7



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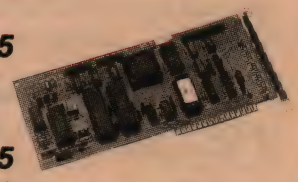
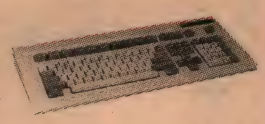
  Serial and parallel port
  Clock/Calendar $55
- MIO Magic II
  Serial, parallel, and game port
  Clock/Calendar
  Up to 576K software $135
- Floppy/Hard disk controller $120
- Floppy controller $35



KEYBOARDS

- 5150 style keyboard $45
- 5151 style keyboard $70
- AT™ style keyboard $70
- AT™ Enhanced-keyboard $99



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- Dynatech DS4 Surge Protector $69
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7413	.33	7486	.30	74166	.90
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7425	.25	7493	.30	74174	.70
7427	.25	7496	.30	74175	.80
7428	.25	74107	.20	74192	.70
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7432	.20	74116	.99	74195	.80
7433	.25	74121	.27	74199	1.00
7438	.22	74123	.40	74221	.60
7440	.19	74125	.40	74273	1.75
7442	.35	74139	.35	74298	.40
7445	.49	74145	.40	74365	.60
7447	.59	74148	.90	74366	.60
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LS08	.15	LS133	.25	LS257	.45
LS09	.15	LS138	.35	LS258	.50
LS10	.15	LS139	.35	LS259	1.00
LS11	.15	LS145	.75	LS260	.40
LS12	.25	LS151	.35	LS266	.30
LS13	.30	LS153	.35	LS273	.75
LS14	.30	LS154	.85	LS279	.30
LS15	.20	LS155	.50	LS280	.80
LS20	.15	LS156	.42	LS283	.35
LS21	.16	LS157	.35	LS290	.70
LS27	.20	LS158	.35	LS293	.75
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LS33	.25	LS162	.60	LS323	2.25
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LS38	.25	LS164	.56	LS364	.90
LS42	.35	LS165	.80	LS366	.40
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LS54	.25	LS169	1.00	LS368	.30
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LS74	.28	LS181	1.25	LS375	.35
LS75	.28	LS191	.80	LS377	.90
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LS109	.20	LS197	.75	LS645	.75
LS112	.25	LS221	.50	LS670	1.00
LS113	.25	LS240	.50	LS724	.40
LS114	.25	LS241	.60		
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ALS08	.45	ALS30	.45	ALS113	.45
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S05	.25	S133	.29	S241	.75
S08	.29	S134	.40	S244	.99
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S11	.25	S139	.60	S280	1.25
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3.120	1.20	14.31818	1.00
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3.4560	1.49	15.2	1.10
3.579545	.60	16.00000	1.50
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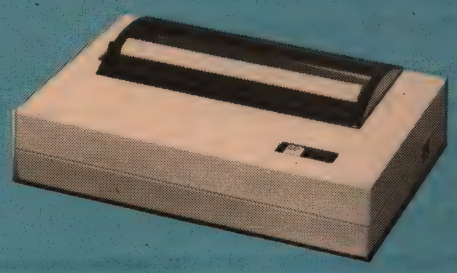

Manufactured by Canon
Original List Price $199.00
Originally Manufactured For The PC JR

ABSOLUTELY ONE OF THE BEST DEALS WE HAVE EVER OFFERED. WE GOT THESE FROM A VERY LARGE AMERICAN OEM.

THIS COMPACT PRINTER (WIDTH 12.3" x DEPTH 8.7" x HEIGHT 3.5") OFFERS STANDARD ASCII, 96 CHARACTERS, UPPER CASE AND LOWER CASE. IT HAS FOUR PRINT MODES:

STANDARD - 80 CPL
COMPRESSED - 136 CPL
DOUBLE WIDTH - 40 CPL
COMPRESSED DOUBLE WIDTH - 66 CPL

THE 5 x 8 DOT MATRIX, 50 CPS SUPER PRINTER CAN ALSO UNDERLINE, DOES GRAPHICS, DRAWS SPECIAL CHARACTERS UNDER PROGRAM CONTROL, AND EVEN HAS AN EXTENDED CHARACTER SET FOR INTERNATIONAL LANGUAGES.

THIS SERIAL PRINTER ALSO USES VERY INEXPENSIVE THERMAL PAPER. WORKS WITH PC JR., PC, XT, AT, CLONES AND MANY MORE.

BRAND NEW IN BOX!! **$39.95** +$4.00 Shipping and Handling

GROUP SPECIAL 4/$139.00

Optional: For PC, XT, AT, or Clone, Add $3.00 For Connector.

TEXT TO SPEECH BOARD!

PC/XT COMPATIBLE - MAKE YOUR COMPUTER TALK!

A VERY POWERFUL AND AMAZING SPEECH CARD. USES THE NEW GENERAL INSTRUMENTS SPO256-AL2 SPEECH CHIP AND THE CTS256A-AL2 TEXT TO SPEECH CONVERTER.

THIS BOARD USES ONE SLOT ON THE MOTHERBOARD AND REQUIRES A COM SERIAL PORT. BOARD MAY ALSO BE USED IN A STAND ALONE ENVIRONMENT (EXTERNAL POWER SUPPLY) WITH ALMOST ANY COMPUTER THAT HAS A RS232 SERIAL PORT. TO USE THE BOARD IT IS ONLY NECESSARY TO SEND ENGLISH TEXT TO THE RS232 INPUT ON THE BOARD. THE BOARD INCLUDES A 1500 BYTE TEXT BUFFER AND HANDSHAKE LINE TO ALLOW YOU TO SEND DATA TO THE BOARD; THE SAME AS YOU WOULD SEND DATA TO AN RS232 SERIAL PRINTER. YOU CAN SET UP BATCH FILES THAT WILL MAKE YOUR COMPUTER GREET YOU WITH "GOOD MORNING MASTER," ETC. EVERY TIME YOU TURN IT ON.

DEMONSTRATION SOFTWARE AND A LIBRARY BUILDING PROGRAM ARE INCLUDED ON A 5¼ INCH PC/XT DISKETTE. FULL DOCUMENTATION AND SCHEMATICS ARE ALSO INCLUDED.

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Half Height, 1.2 MB, AT Drives Genuine IBM Drive w/Rails	$112.50 + $3.00 Shipping
IBM Floppy Controller Card w/Cables	$37.50
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THIS MONTH'S SPECIALS

XR2240	1.19	68A09EP	1.29
SG3524	.79	Z80CTC	.49

400/800 CASSETTES

REQUIRES ATARI RECORDER

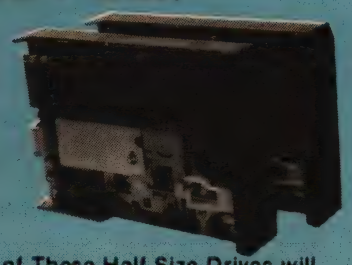
We bought 5 skids of these cassettes. Titles include: *Touch Typing, Invitation to Programming I & II, Hangman, Introduction to Sound, Blackjack, Juggles House, Juggles Rainbow, Introduction to Graphics, States and Capitals, European Countries and Capitals, Scram and Writing Programs Two.* These are a very high quality recording tape and may be recorded over for excellent reproduction. Most come in cassette holders. Sorry, no choice on titles. Super good assortment (some duplications when necessary). Most C-60. May be last chance to obtain these.

10/$10.50 or 20/$17.50

WE'VE GOT EM!

5-1/4" HALF SIZE DRIVES!

For IBM PC, TI PC, XEROX 820



- 40 Track per side 48 TPI
- Double-sided, double density
- Fast access time - 6 ms

*Two of These Half Size Drives will Fit in the Same Space as 1 Full Size Drive!

$69.95

ADD $3.00 UPS PER DRIVE

- 80 Track per side 96 TPI
- Double-sided, quad density
- Fast access time — 6MS

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$99.95

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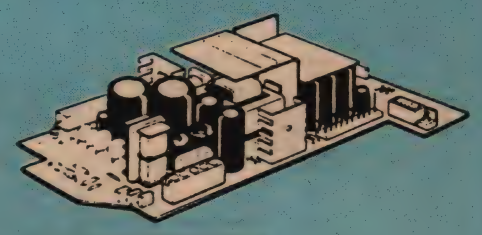
Switching Power Supply!

+ 5VDC - 7 Amps
+12VDC - 2 Amps
-12VDC - .25 Amp



$29.95 EA

4 FOR $99

ADD $2 EA. UPS

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REPEAT OF A SELL OUT!

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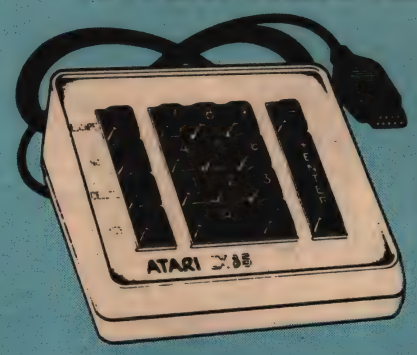


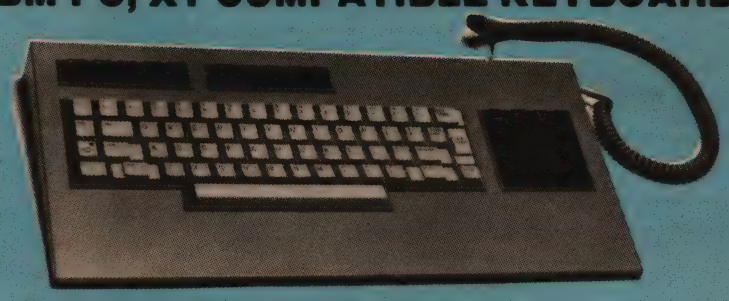
$7.95

3 for $20.00

Add $1.00 per unit for postage.

Originally designed for use with an Atari Home Computer. Brand new in box. Encoded using the popular National Semi 74C923. Full schematic included. Originally sold for many times our price. Many applications besides computer use.

IBM PC, XT COMPATIBLE KEYBOARD



Computer manufacturers excess.
Brand new units manufactured by Micro Switch.

Kit includes keyboard, plastic housing, with built-in palm rest.
Coiled connecting cable and hardware.
Assembles in only 3 minutes.
Has same make and break codes as standard PC, XT keyboard.
Also works fine with most clones or compatibles.
This high quality American manufactured keyboard with custom designed housing originally cost a large OEM over $100.00 each in very large quantities.
Coiled connecting cord plugs into keyboard for easy replacement.
Extra cables $3.95

$29.95 Each *or* 3/$81.50

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Filecard 20 MB	$555
Maynard 20 MB Hard Card	Call
Seagate 20 MB Int. w/cont.	$369
Seagate 30 MB Int. w/cont.	$479
Seagate 30 AT Int.	Call
Tandon 20 MB Hardcard	$429

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Everex 2400	$229
Hayes 1200	Call
Hayes 1200B	Call
U.S. Robotics Courier 2400	$349
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MSP-15	$379
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120-D	$185
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NEC	
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PANASONIC	
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Thickness	.003 inches
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Coating thickness	100 micro inches each side (burnished)
Hygroscopic expansion	coefficient less than 15 × 10^{-6} in/in/RH%
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Coercivity	320 oersteds nominal
Resistivity	less than 5 × 10^{9} ohms per square
Clipping level	75%-guaranteed 50%
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Track density	48 TPI
Torque	
Starting	1.0 ounce force in. max
Running	≤ 3.5 ounce force in. max., 1.0 force in. min
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- *A clock calendar for automatic time and date*
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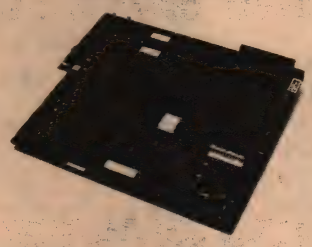

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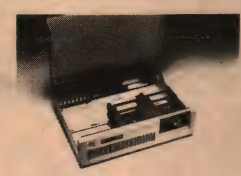

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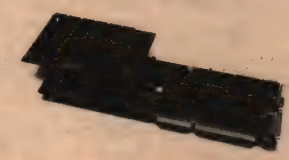

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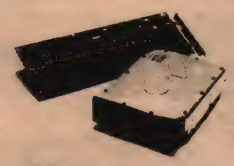

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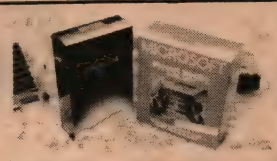

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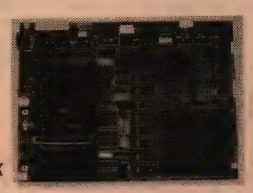

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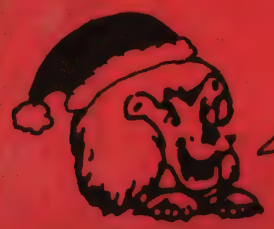

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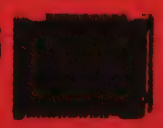

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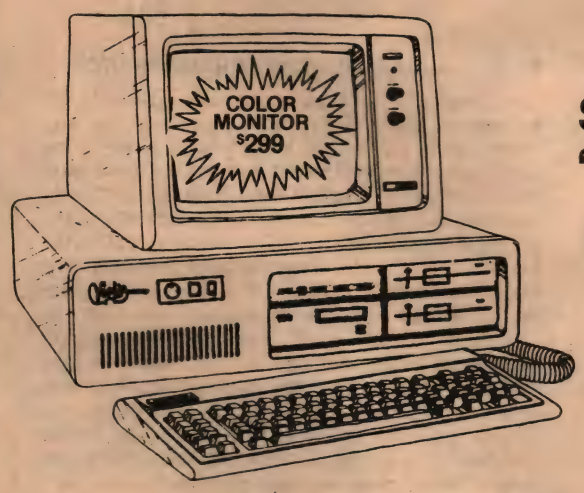

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Max Memory on Motherboard	1024K	1024K	?	?
Power Supply Watts	230	230	192	?
Manual Reset Switch	YES	YES	NO	?
Runs UNIX	YES	YES	YES	?
EGA Card Compatible	YES	YES	YES	?
80287 Math Coprocessor Slot	YES	YES	YES	?
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THE COMPATIBLE SHOPPER

(A Survival Guide to Computer Shopping)

(Or Why We Bought Columbia Data Products, Inc.!)

As I was searching for a topic for this month's letter, my wife was absent-mindedly leafing through the pages of this magazine.

"LOOK, AN XT-COMPATIBLE FOR ONLY $250!!! AND A REAL IBM-XT FOR $1500!!" she exclaimed. Being a bargain-hunter at heart (her motto is "born to shop"), she was so excited that I hesitated to burst her bubble. "Read the fine print," I muttered, not bothering to explain the myriad of reasons behind such "too-good-to-be-true" prices. Then I realized I'd just stumbled across a topic for this column.

Our conversation went something like this:

WHAT'S THE DIFFERENCE, THEY ALL SAY "COMPATIBLE"?

Full software and hardware compatibility means that all software and hardware components are interchangeable and work the same in the original or in the compatible machine. True 100% compatible computers are counterfeits, so the trick is to find a computer that's functionally equivalent without being an illegal copy. How much compatibility you need depends on what you are using now. No problem. . . just ask the manufacturer if your software runs on his machine (if he can talk to the manufacturer — and he has tested it). But how DO you insure future compatibility when you need hardware or software enhancements? You choose a stable company that gets consistently high ratings for compatibility and one that can provide future support. For example, although industry experts have always ranked Columbia a top compatible, we recently discovered that it was not EGA compatible. So we changed the ROMBIOS in version 4.36 for their existing products from time to time. Many other large manufacturers who claimed full compatibility for their products, and then had them fail in the marketplace, are dropping some models because they are not as compatible as their newer ones.

CAN A COMPANY ADVERTISE A COMPUTER THAT IS AN ILLEGAL COPY?

Sure, it's done all the time by many vendors. Many computer products that come in from overseas have the ROMS removed before shipment so they can pass customs. IBM and others are now attacking the source of the supply instead of just the vendors. According to a recent article in *Infoworld*, "IBM is regularly testing PC clones for infringement of IBM's copyright on the BIOS software for its machine." If you purchase one of these questionable clones, you may own an orphan when legal problems cause the manufacturer to disappear. Columbia's ROMBIOS was designed independent from IBM and has never been challenged.

IF IT HAS A WARRANTY, IT MUST BE RELIABLE, RIGHT?

The warranty is important, but reliability involves several factors. First, it has to be a well engineered product that has been subjected to extensive EMI, heat, and high voltage stress tests to insure that the unit will last. It must also meet rigid FCC and UL requirements. (I was nearly electrocuted while testing an imported computer for FCC approval — we found the power supply was wired backwards. We rejected that manufacturer!) Each individual component must be thoroughly burned in for at least 72 hours to prevent 25¢ parts from causing $250 repairs. Some manufacturers only do sample testing, so some defective computers do get shipped. The most important reliability consideration — consistent performance — can only be judged by the computer's track record. What do the experts say? How many have been sold? Are the owners satisfied? Is there a service contract? If you can't get satisfactory answers to these questions, then beware.

WELL, WHAT ABOUT THE WARRANTY?

Warranties show the good intentions of the manufacturer. Few manufacturers plan to abandon their warranty, but lack of adequate planning and resources sometimes hinders performance. How many claims could be handled by a business offering a two-year parts, labor, and satisfaction warranty . . . from a company that started last week "building" computers in their garage? FCC and copyright violations can also hurt your chances of using your warranty since legal problems weaken the company. On the other hand, if a company enjoys a good service reputation along with a reliable product, you can be confident they will honor the warranty.

WHAT SHOULD I LOOK FOR IN EXPANDABILITY?

We may soon have 500 megabyte databases in the form of laser disks . . . but only if your computer can support the necessary hardware and operating systems. The number of expansion slots, size of the power supply, speed, number of drive openings, and memory capacity are also important factors if you want to add something that wasn't envisioned when the machine was originally designed. For example, when 8087 math coprocessors were selling for $400, some manufacturers did not include this socket. Although networking capabilities are still not widely needed, this is just one example of functions that may be excluded if your computer is not appropriately designed. Many manufacturers still do not include space for at least four drive-size devices or the power to run them. As you can see, it is very important for a manufacturer to plan for the implementation of new technology after the purchase.

ISN'T IT IMPORTANT TO BUY A NAME BRAND?

It is really important to compare equivalent configurations. Make a list of the features that you want. Ideally, you should be able to price the same combinations of equipment from two or three carefully selected manufacturers. In reality, this is possible but difficult, because you cannot always tell what they have left out. For example, if MS-DOS is included, do you assume that it comes with Basic and all the manuals? If you assemble parts from 10 different vendors, chosen strictly by price, will they "talk" to each other? If one part malfunctions, can you tell which one? Can you convince the vendor that it's not a software (or hardware) compatibility problem? Some additional facts to consider . . . **SPEED:** our tests indicated that CPU speed can be deceiving. Floppy Format took 106.5 seconds on the 8 Mhz Taiwan clone and only 69 seconds on the 4.77 Mhz Columbia! **COMPATIBILITY:** holding the alternate key down and typing in a 3-digit ASCII code should put any 256 ASCII code on the screen (a standard compatible feature) . . . worked on the Columbia (and IBM) — but not on the Taiwan clone!

IT LOOKS LIKE THE COLUMBIA IS A GREAT VALUE FOR THE PRICE. WHAT ELSE CAN YOU TELL ME ABOUT IT?

The fact that there are 70,000 Columbia owners says a lot about its popularity and reputation. They are also well supported by the Columbia Owners Group. COG is currently sending newsletters to 15,000 registered owners and plans to reach the others by word of mouth. Fully documented versions of DOS and BASIC, as well as a readable operations manual, are included in the purchase price. We have designed our latest Columbias so you can start using the computer immediately without having to learn DOS. We have done this by not only loading the hard drive with all the software, but by setting it up with a menu system that bypasses DOS commands. When you get ready to learn DOS, we not only have DOS tutorials but a unique on-line help feature as well. Just type "HELP" from DOS and your questions will be answered! (See the next few pages for many other Columbia features). And don't forget the seller's reputation. The Godfather has been around a few years and plans to protect his name. You can depend on Godfather's to stand behind its products.

After completing my short course in compatible shopping, Mrs. Godfather is sold on Columbia. She thinks you'll agree . . . IT'S AN OFFER THE DISCRIMINATING "COMPATIBLE SHOPPER" CAN'T REFUSE!!

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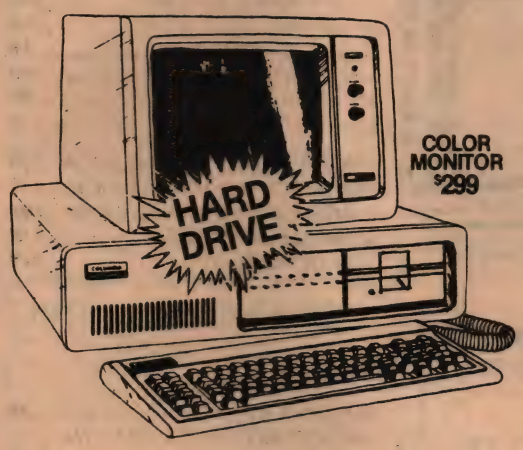

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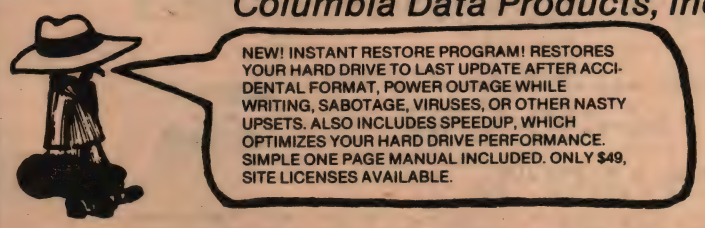
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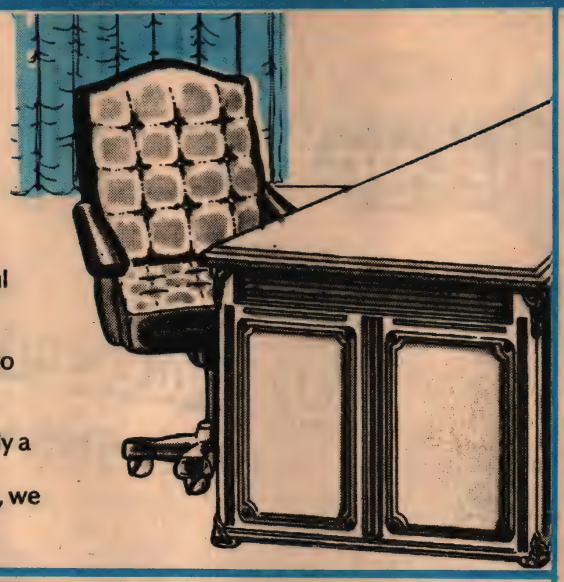

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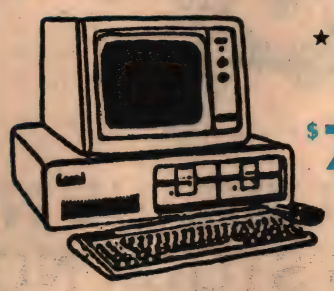

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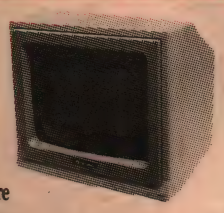

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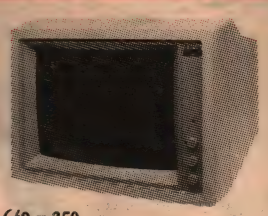

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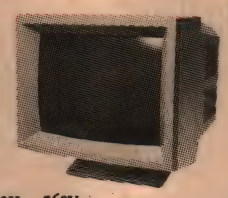

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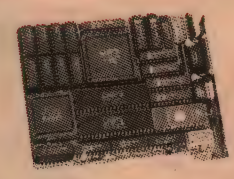

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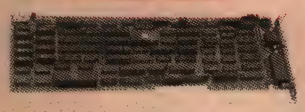

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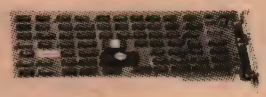

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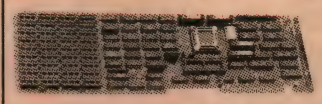

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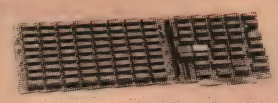

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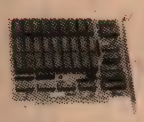

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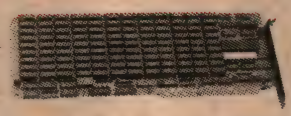

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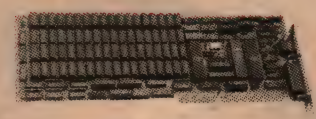

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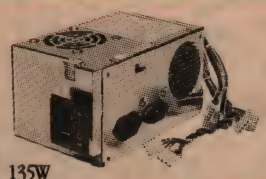

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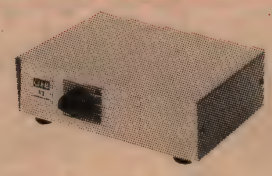

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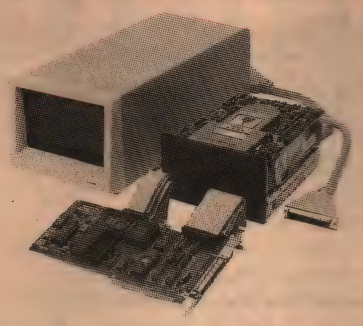

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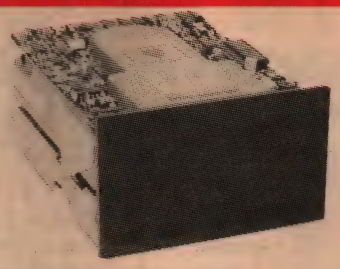

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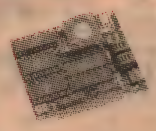

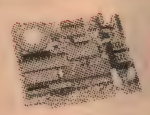

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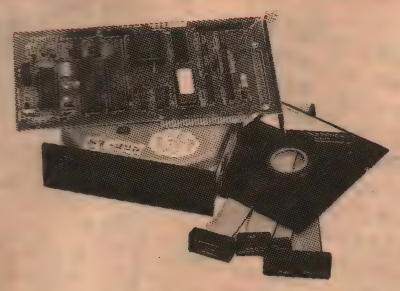

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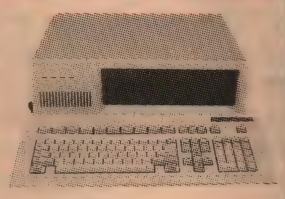

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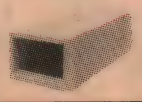

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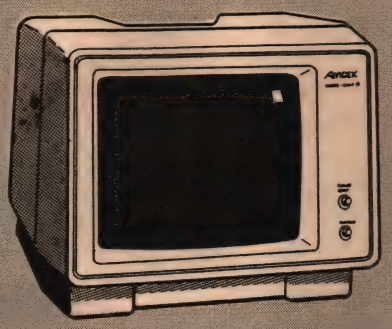

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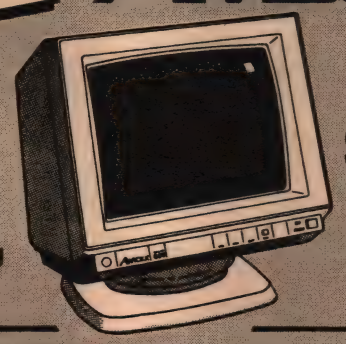

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Equity III+ Has Increased Performance

Epson America, Inc. has announced the newest member of its family of high-performance computer products. Labeled the Equity III+, it replaces the popular Equity III and is designed to provide an even stronger base for cost-effective computer systems for business, scientific and engineering applications.

"Equity III+ exemplifies our commitment to the PC market to provide competitive products that offer outstanding value and high performance," said Peter Bergman, group product manager/systems for Epson America.

Available in the first quarter of 1987 through Epson-authorized dealers, the 16-bit Equity III+ is fully hardware and software compatible with IBM PC/AT, yet provides a 25 percent speed improvement with a list price of only $2,695 for the base system. When equipped with a high-performance, 40 megabyte Winchester disk drive that features an average access time of 28 milliseconds, the system has a suggested list price of $3,895.

The Equity III+ comes with an 80286 microprocessor capable of running at three switch-selectable clock rates: 6, 8 or 10 MHz. When the Equity III+ is used as a workstation for scientific and engineering tasks, such as computer-aided design (CAD) or engineering (CAE), an optional multispeed (up to 8 MHz) 80287 math coprocessor chip adds extra computational power.

A 192 watt power supply that accepts either 115 or 230VAC input for worldwide operation, combined with internal expansion slots for as many as nine full-sized option cards (seven slots for 16-bit cards and two 8-bit slots) allow users and VARs (value-added resellers) to add option cards to create exactly the system needed for any computer-based task.

Despite this expansion capability, the Equity III+ has a small footprint measuring 19.6 (depth) by 17.4 inches (width). All Equity III+ systems come standard with built-in parallel (Centronics) and serial (RS-232C) ports for easy interface to system peripherals.

The Equity III+ system architecture supports two distinct operating modes that cover business applications: a real-address mode for single user applications such as desktop publishing or word processing and a protected-virtual-address mode allows the computer to work equally well in multiuser/multitasking environments where several users share common data through spreadsheets or database management programs. The protected mode supports operation in large-scale data-processing applications, including financial modeling and manufacturing requirements programs (MRP).

A basic Epson Equity III+ configuration includes 640K bytes of main system memory (which is expandable to 15.5 megabytes) and features byte parity to ensure data reliability, 64KB or ROM, an internal system clock/calendar with battery-backed CMOS RAM, a security keylock switch that prevents unauthorized access to the system, a 1.2 megabyte 5.25-inch floppy disk drive and an enhanced IBM AT-style keyboard.

The latest version of the MS-DOS operating system (version 3.2), a set of system diagnostics and GW-BASIC are included with Equity III+. The MS-DOS operating system supports system networking and gives users access to the large base of software written for the IBM desktop computers.

Options available for the Equity III+ include IBM-compatible Color Graphics Adapter (CGA), Multi-Mode Graphics Adapter and Enhanced Graphics Adapter (EGA) boards plus a selection of color and monochrome monitors suitable for text and graphics, including computer-aided design. To expand the system's mass storage, users can opt for additional 360KB or 1.2 megabyte 5.25-inch floppy disk drives or additional hard drives or tape back-up devices. The Equity III+ features three externally accessible and two internal half height mass storage slots, for even greater flexibility.

All Equity systems come with Epson America's one year limited warranty.

For more information contact Epson America's Computer Products Division, 2780 Lomita Blvd., Torrance, CA 90505; (213) 539-9140. ●

continued on page 164

Wash and HotDOS! Hotdog! More Freeware Utilities

by Hal Nieburg

Here are two more freeware/public domain utility programs. The first, Wash, an oldtime classic, tracing back to CP/M days, is an excellent file manager; the second, HotDOS partitions RAM, permitting loading and switching between two active programs simultaneously on a single computer, providing a DOS shell exit for applications that lack this valuable feature.

Wash Your Disks

Wash was created by Michael J. Karas (Micro Resources, 2468 Hansen Court, Simi Valley, California 93065), in 1981 for the CP/M (Z80 CPU) operating system. In that environment, it achieved classic status. With the success of the IBM PC shortly thereafter, the utility was soon ported to MSDOS. There it has enjoyed reknown among a small cognoscente.

It is compact (only 3K—compared with Sweep, which performs the same functions, but occupies 27K disk space), powerful, and easy-to-use. Although it does not implement sub-directories, it does an array of functions for users with two-floppy PCs. It deserves to be known and used by a larger constituency.

It is a super-duper disk maintenance utility. The inspiration of this program, Karas tells us, came from use of an older CP/M utility called "Clean," which, he discovered at a meeting of the Valley Computer Club (California). "At that time Clean seemed like a dream come true," he writes. But "unfortunately it had several major problems that limited its overall usefulness."

He undertook to make a better Clean, and the original Wash resulted. Now the source code has been ported to DOS, and its wide range of features make it an attractive alternative for file housekeeping chores. Program features are:

a) Alphabetical list oriented file operations.

b) Any legal drive (A: to P:) may be selected.

c) Operator interface to the file list is at the console in sequential alpha order in forward or backup mode.

d) The file list is treated as a circular buffer. Forward or backward scanning of the list wraps around the list back to the beginning or ending respectively.

e) The current list position file can be viewed at the Console, printed on the Lpt1 device, or (an obsolete function to be sure) sent to a Punch device.

f) The current list position file may be deleted or renamed. If renamed, only the new name must be entered.

g) The current list position file may be copied, with the same name, to any other operator-selected disk drive. The copy utilizes all of available memory as the copy buffer for the ultimate in copy speed.

h) The current list can be deleted and the "Wash" operation may be begun upon another operator-selected disk drive.

i) The program is fully implemented in 8080 assembly

continued on page 100

Hard Disk Management Simplified

by Brian K. Lewis, Ph.D.

Finding your way around the files in a 20 megabyte hard disk using only DOS commands can be very frustrating for the novice computer user. I have simplified my life, and that of many clients, by using a DOS shell called 1Dir (pronounced Wonder). This combination file manager and menuing package in its original versions provided you with a screen full of information about your disk files. It also could be set up by the user to run any software on your disk simply by pressing one function key. Since I had found the earlier versions to be excellent time savers, I jumped right in line when the upgrade to 1DirPlus was announced. WOW! Is 1DirPlus ever different from its predecessors! It is so different that menus you developed with 1Dir must be redone to work with 1DirPlus. The positive side of this effort is that all your little batch files can be eliminated because the batch commands are now incorporated into the 1DirPlus menu files. This is a definite space saving advantage on any hard disk.

1DirPlus can also have more customizing options for the user. To start with, the program has eight different menu "faces" or screen appearances. You can select different default menu faces for each of the menus in your menu library. Figures 1, 2, 3, & 4 give you some examples of the available options. You can also personalize the appearance of sub-directories by specifying a directory mask to be used when in the specific sub-directory. In other words, if you only want a list of Lotus WKS (and/or WK1) files in the Lotus sub-directory, you can build that into your menu system by specifying a *.wk* mask for the directory. You can also set up several different masks for a sub-directory and use them in any desired combination. There are so many options available in this package, that the novice user can be easily overwhelmed by it. However, 1DirPlus can also be used with a minimum of custom input. Then, as the user grows more comfortable with the system, additional features can be adopted and customized.

continued on page 166

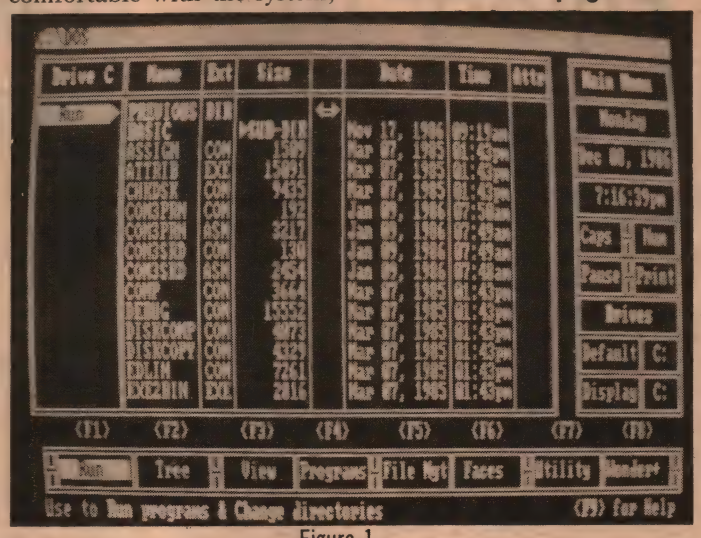

Figure 1

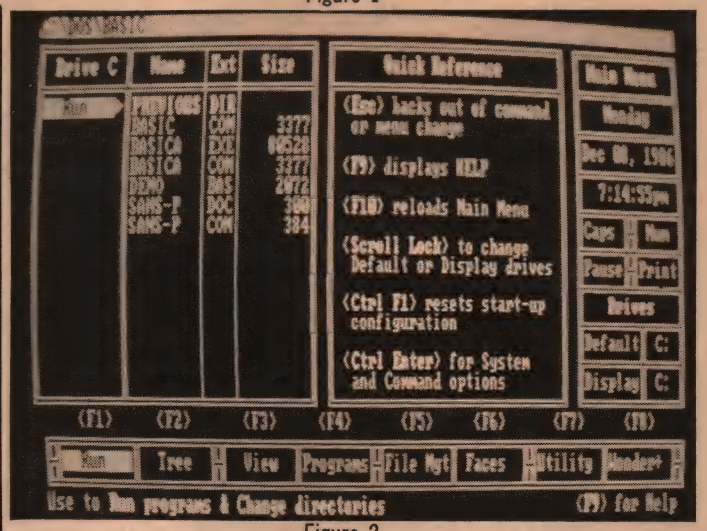

Figure 2

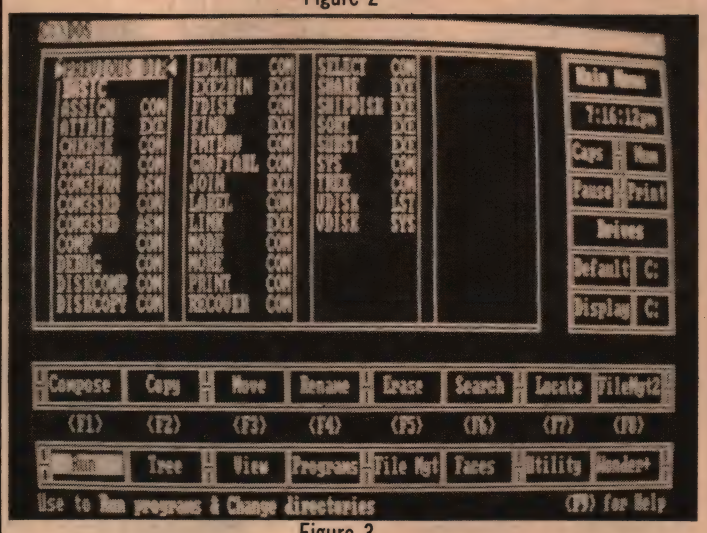

Figure 3

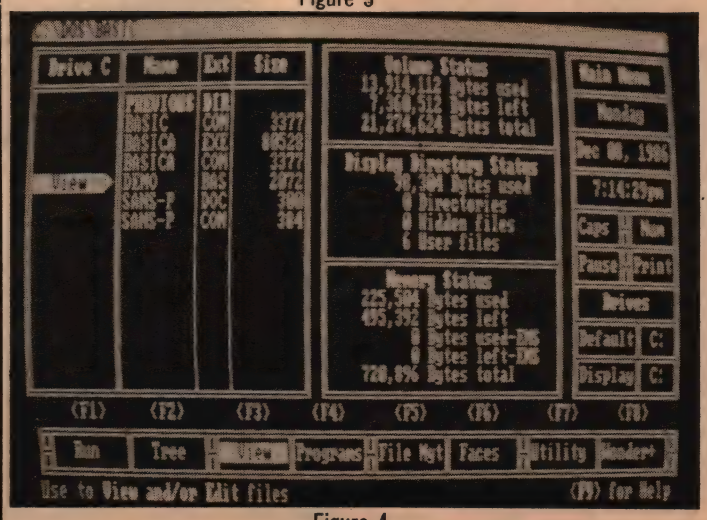

Figure 4

Wash & HotDOS!
continued from page 99

language for speed, small size, and portability to any CP/M 2.2 or 1.4 system.

j) The MSDOS Version is in 8086 assembly language. No assumption is made upon the maximum number of directory files other than available memory space for the list. (A directory with 1024 directory file names takes 12K bytes of storage. Assuming the copy buffer minimum size requirement of 128 bytes, then Wash should run in the CP/M 2.2 20K system with no problems at all.)

k) All directory and disk I/O is handled through calls to the BDOS. This will guarantee Wash compatibility with any CP/M implementation. This makes the program disk media independent, all you have to do is get WASH.COM onto your diskette or hard disk in the first place.

The program, its source code, documentation file, and object code, has been released to the public domain and may be modified to suit your personal requirements. It may be found on numerous remote bulletin boards. The initial release was via the CP/M NET operated by Kelly Smith (3055 Waco Ave., Simi Valley, CA 93063, 805-527-9321/PMMI modem).

Running Wash

The Wash program is run as a transient command at the DOS prompt as follows:

A>WASH	<= = WASH forms working list of all files from default drive A:
A>WASH B:	<= = WASH forms working list of all files from selected drive B:
A>WASH*.COM	<= = WASH forms as a working list of all COM files from default drive A:

Wash will boot up and read all selected file names from the selected drive into a "MEMORY" list that is in ascending alphabetical order. The first file name will be displayed with a ":" prompt awaiting some command from the operator. The commands can be seen in Figure 1:

```
MICRO RESOURCES DIRECTORY "WASH UTILITY" Ver 1.0B
      ( MSDOS VERSION )

      Command          Function
      -------   --------------------------
         V      View file at Console
         L      Print file to List Device
         P      Send file to Punch Device
         C      Copy file to another Disk
         R      Rename file
       ^ D      Delete file
      Q or X    Exit to DOS (Ctl-C also works)
         B      Backup one file in List
         S      Restart on another Drive
? or H      List this command table
   sp or cr   Forward to next file in List
```

Figure 1—The Wash Menu

File Forward (SPACE or CARRIAGE RETURN)—This command will increment the displayed list pointer and then display the next file name in the list. If last file name in list is currently displayed, the message "End of List" is displayed and file name display wraps around to the first file name.

Backup (B)—This command will decrement the displayed list pointer and display the previous file name from the list. If the first file name in the list is currently displayed, the message "Beginning of List" is displayed and the file name display wraps back to the last file name in the list.

View (V) File—The contents of the currently displayed file name is output to the console screen. Text is normally assumed to be ASCII and file display ceases upon encountering a logical end of file character (01AH) (ctl-z).

Punch (P) File—The contents of the currently displayed file name output to the CP/M logical Punch device. Text is normally assumed to be ASCII and file punching ceases upon encountering a logical end of file character (01AH) (ctl-z).

List (L) File—The contents of the currently displayed file name is output to the CP/M logical List device. Text is normally assumed to be ASCII and file listing ceases upon encountering a logical end of file character (01AH) (ctl-z).

Copy (C) File—This command allows the complete contents of the currently displayed file name to be copied to a file on another operator selected drive with the same name. If the file name already exists on the destination disk, the operator is asked if it should be

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MacProof 2.0 (4187) A speller and writting style checker. This interesting program provides feedback on style and structure such as capitalization, punctuation, racist, & sexist language, confused words and nominations. The dictionary has 93,000 words and is modifiable.
Laserwriter Programs (4188)
This disk contains a number of PostScript™ programs to use with the Apple Laserwriter. It facilitates printing pictures at a very high resolution. A must for the serious graphics artist.

BUSINESS

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Jazz Sampler (4190)
A slide show showing the features of the integrated program Jazz from Lotus.
Business Programs (4106)
Office Manager (Accounts Receivable: prints ledgers, deletes inventory)
Also included are Excel™ templates: Depreciation, Revenue.

EXCEL™ TEMPLATES

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Life Planner, About Excellent Exchange,Catalog, Tip Sheet & Order Form.
Excel templates (4165)
Database Macros, 1st. and 2nd. Mortgage, Time Weighted IRR, Roots of Equations, Steam Volume,Triangles Monthly Calendar, Truth in Lending, Mailing Label II, Tax Templates, Macro Function Tutor & Travel Expense Weekly.
Excel templates (4166)
1986 Calif. Payroll and Checkbook organizer with documentation.
Also included: Programmer•Self, a programmer's financial planner's calculator. This program will allow you to print your steps onto the Imagewriter™.

dMAC III Demo & Examples (4167) Relational Database program.

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Includes Musicworks Demo which plays back songs. You can't write your own songs unless you have the commercial Musicworks. Songs included: "Invention #1", "Ballet de la Royne", "Born Free", "For Your Eyes Only", " Raiders of the Lost Ark", "The Gambler", "Jump" and many more.
Musicworks™ songs (4128)
Pop Music songs.
Concertware+™ Songs (4123)
A varied selection of classical as well as contemporary songs.

MIDI MUSIC APPLICATIONS

These programs require a MIDI Keyboard. Midi Synthesizer programs.

Midi Term (4117) Midi 2, Midi Mouse, 7th Heaven
CZedit Demo (4118) CZlibrarian (For use with the Casio CZ101™ Keyboard).

EDUCATIONAL

Flashcard (4138) Orbital Mixing & Grades folder.
Math Master (4139) Venn, Conformal Maps, Automata, Tree and Tangent.
Speech Synthesis (4140)
The following programs demonstrate Speech Synthesis: Rona,Talking Eliza with demo files & instructions, Speak Easy and La Limerick Machine. (This one will read limericks that are typed)
Math Tutor (4181)
Weinberg. This program facilitates drawing math functions like integrals,summations etc. Equation, Math Drill & Camera tutorial.

ENGINEERING

DesignScope (4119)
Simulation Program that helps design component Circuitry.(Demo Version)
Digital Simulator (4120)
Digital Logic Simulator. Build & test electrical circuits.

TELECOMMUNICATIONS

Red Ryder 9.4 (4111) Latest update. It has an autodial feature and can store up to 80 telephone numbers. It also allows you to receive files automatically in any of 3 modes: ASCII, XMODEM, and KERMIT.
Red Ryder Macros (4090)
Contains Dow Jones™ & E. F. Hutton Quotes. Also contains a listing of area codes.
Termworks 1.2 (4112) Supports MacBinary & Macro capability for storing numbers & protocol settings. Also included are Freeterm 1.8, Packit III and FModem.
Communication Utils (4107)
BinHex 5.0. Supports the new .BIN protocol, as well as the old .HEX, .HCX &.HQX protocols. PackIt III 1.2 (Compress your data for faster transmission), Compact, AppleTalk Chat and more.

HACKER TOOLS

H. Tools (4100) DrawPaint 1.0 (Convert MacDraw files to MacPaint.) TabUtil. (Text File processor: add or remove tabs.) Icon Exchanger, Icon Collector, Cleanup, Iconer & more.
H. Tools (4108) Patchdisk (Get into any sector of a disk and modify it!), PurgeIcons, Disk Test, Answering machine and more.
Programmer Utilities (4162)
Softools™ (Draw many standard software engineering drawings such as Dataflow diagrams, flowcharts etc.). Fast Eddie. A powerful programmers' text editor. Includes documentation. Also included is MacroEdit.
Programmer Utilities (4163)
MemTest, MightFinder, FOBJ Format, PRAM 2, Font -FKEY-DA sampler. (This very useful program will open any font, Desk Accessory or Function Key without having to install them onto the System. Also included: Cleanup, Mac ID, Hex & Ascii Strings.
Developer Stuff (4087)
ResDecompile. A Macintosh application which can convert certain types of resources in a resource file, into source code suitable for compiling with ResEdit (Apple's Resource Editor).
Developer Stuff (4088) Obi Systems ID's, archiver & more.

DESK ACCESSORIES

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Quick Print (4042)
MiniFinder D/A, HP 12C Calculator, Hacker D/A's, D/A Sampler, more.
Hacker D/A's (4044) Abacus, Timer, MemScan, NumCaps, Continuity, MacVision 1.1Knockout windows.
Hacker Tools (4108) Patchdisk, Purge Icons, Disk Test, Answering Machine, and Fast Disk Copy.
Icon Maker 2.0 (4045) Design your own icons). QuickPrint (Print textfiles while working on other applications), Financial Calculator etc.
Function Key (4046)
Desk Accessory, Font/DA Mover 3.2, Fkey Installer, Fkey Sampler.
Rolodex, Disk (4047)
Info, Fun D/A's, Fkeys: Fontsie & Showkey.

TELECOMMUNICATION DA'S

MockPackage (4048) Use your modem concurrently while working on other programs.
MockWrite,MockTerminal, Mock Print Disk Info D/A's: Checksum, Utilities 2.0, Disk Info 1.42.
Communication Utilities (4107)
Binhex, Appletalk Chat, Cheese Hacker Pack It.

GRAPHICS DESK ACCESSORIES

Artisto (4049) (Loads MacPaint files), Animator, Read Macwrite D/A, Function Key installer and sample function keys.
(4014) Big Ben (clock D/A), Calendar, & Text File Reader.

DISK CATALOGER

Disk Librarian (4098)
Excellent for cataloging extensive libraries. Just run the program & insert disks. Includes multiple sort functions.

UTILITY PROGRAMS

System Utilities (4182)
BootEdit. Alter the "Welcome to Macintosh" message ,Change application font, Install resources to your system that will RESUME your program after many system bombs, Window Changer. Lets you customize the Save As & Open dialog boxes .
Disk Utilities (4183)
Disk Cat. Disk cataloging program. Disk Test, Display (text file reader), & Scavenger Mac (recover files).
Diagnostic Utilities (4184)
DiskTest, Speed Check, Ram Test 1.7, Dir-Acta-ry (Reads directory of disk and then converts it to an outline document for use with the Acta DA.),Remount HD20 (Remount an Apple HD20 that has been accidently thrown into the trash).

UPDATED DISKS

Redit 1.2 (4185)
European Resource editor. This program is excellent for translating Macintosh programs to other languages. It does not alter any of the resources.
Switcher 5.0. (4186)

LANGUAGES

Basic Compiler (4101) Complete with documentation and examples.
Smalltalk (4099) Disk also includes Ada and a 68000 disassembler.
Xlisp 1.4 (4037)
McAsm (4033) 68000 Assembler and Linker.

MS BASIC PROGRAMS

Communication Utilities (4018)
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MACINTOSH

Apple Provides Network With AppleShare File Server

by Rich Fields

Apple Computer has introduced a family of communications products designed to network Macintoshes into workgroups. These Apple workgroups are designed for business applications where up to 25 users can share both the peripherals required for the system, and the software. The users can send information to each other and the very documents being produced. To do so requires that the file servers be simple to learn and use.

Paul Friedman, Apple Marketing Manager for Desk Top Communications says, AppleShare is an extension of the Macintosh concept into workgroups. As such it features all the technology that made the Macintosh computer so popular, including its ease of use, consistency across applications and graphics. "If you know how to use a Macintosh, you know how to use AppleShare. And because AppleShare works the way other Macintosh applications work—maximizing ease of use and graphics—it requires minimal training and support."

The AppleShare file server working with AppleTalk Network is ideal for use by small companies, departments within larger firms and university faculty and administrators. The file server software is configured with a dedicated Macintosh Plus personal computer and a hard disk. Each user can access information from anywhere on an AppleTalk network as if it were resident on their own Macintosh.

Nearly all the existing Macintosh applications will operate unmodified on AppleShare. New enhanced software products such as Microsoft Word 3.0 for productivity in document processing have been released to take advantage of AppleShare's advanced features. Many software publishers and network hardware manufacturers announced support for the new Apple products.

The AppleShare file server software is available now for a suggested retail price of $799. Required hardware includes a dedicated Macintosh Plus and a hard disk as the server. Appropriate AppleTalk personal network cables and connectors for each workstation and the server, are also required. Workstations on the network may be any member of the Macintosh family with at least 512K or more of memory.

An additional network service such as electronic mail, or print spooling may also be run on the AppleShare server. Storage capacity may be increased with additional and/or larger disks for up to hundreds of megabytes of on-line storage.

Additional AppleShare servers may be added to a network as well as interconnecting to many AppleTalk Networks through bridges. User access remains the same, completely transparent to the users.

AppleShare Bridge To MSDOS

The AppleShare file server was designed to support files from many operating multiple operating systems including MSDOS, Apple and several third parties plan to provide the required MSDOS workstation software to connect AppleShare later this year. Most of the major network manufacturers such as Novel, 3Comm and Corvus have announced support for AppleShare and AppleTalk Network.

Apple has also introduced a half-sized PC card called the AppleTalk PC card. The AppleTalk PC card contains a 65C02 microprocessor and AppleTalk protocols in ROM. Also included is software that converts MSDOS generated text to the PostScript page-description language allowing printing to the Apple LaserWriter. The card supports the conversion of several file formats including WordStar, Lotus 1,2,3, MultiMate, Microsoft Word, Diablo 630, ASCII and PostScript files.

AppleTalk Network with AppleShare

The AppleTalk PC card enables MSDOS personal computers to share information on the Apple networks and to access Apple's LaserWriter printer for typeset-quality printing of text and graphics.

The AppleTalk PC card will be available early in 1987 and will sell for a suggested list price of $399.

AppleLine 3270 File Server Transfer Program

In addition, Apple introduced two software utilities—the AppleLine 3270 File Server Transfer program for transferring files between the IBM 3270 mainframe environment and Macintosh via Apple's 3270 protocol converted AppleLine and the ADCA (Document Content Architecture) Filer, a utility that translates documents from popular

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Industry Supports Apple Communications Products

Infosphere Announces AppleTalk Modem Server

Infosphere, Inc. recently introduced the first modem server for AppleTalk networks at the Seybold Conference on Desktop Communications. Called ComServe, it is the only software product on the market that provides terminal communications to Macintosh local area networks. ComServe is the third major component of the growing Infosphere family of AppleTalk solutions.

Characteristic of the Infosphere product family, ComServe is a software solution. By running concurrently in the background of a Macintosh workstation, it eliminates the need for any dedicated hardware. Additionally, users have the option of installing ComServe on Apple Computer's new AppleShare file server. ComServe is transparent to the leading Macintosh telecommunications products, such as MacTerminal, Microphone, Smartcom, and AppleLink. It supports Hayes compatible modems at speeds from 300 to 9600 baud.

ComServe is scheduled for second quarter release with an introductory price of $195 per server. It will be available from leading Apple dealers and Infosphere's international distribution channels.

For more information contact Infosphere, Inc., 4730 Southwest Macadam Avenue, Portland, Oregon 97201 USA; (503) 226-3515.

Letraset Supports Apple's Communications Framework

Newly acquired Ready,Set,-Go! page-design program for the Macintosh maintains compatibility with Apple environment.

Letraset, which recently acquired worldwide marketing rights to Ready,Set,Go!, has announced full support for Apple's communications framework. As part of this effort, Letraset will continue to use standard Apple printer drivers with all current and future versions of Ready,Set,Go!

Ready, Set, Go! will remain fully compatible with the AppleShare file Server system, and with third-party offerings such as TOPS and MacServe. Ready,Set,Go! will also continue to take full advantage of available print-spoolers which operate according to standard Apple protocols.

Software enhancements and additional product offerings will work together with the existing and future architectures, enabling technologies and products which comprise Apple's communications framework.

For more information contact Letraset USA, 40 Eisenhower Drive, Paramus, N.J. 07653; Tel. 201 845-6100; Telex 134430.

Du Pont Adds Fiber Optics To Apple Macintosh Network

The Du Pont Company has designed and introduced a

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Industry Supports
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fiber optic local area network (LAN) for Apple's "AppleTalk" networks that allows fiber optic replacement or extension of the standard copper wire twisted-pair "AppleTalk" personal network cabling system. "AppleTalk" networks utilizing the Du Pont development can incorporate more computers and extend farther than was previously possible.

"'AppleTalk' networks can now readily connect three times the usual devices and go five times the regular distance between stations, with a total network length that is practically unlimited," said Jim Somerville, who heads Du Pont's optoelectronics systems marketing effort. "Even 100 computers, or more, almost a mile apart can be interconnected, bringing fiber optic technology benefits to business and industrial environments." The announcement was made during the Jan. 28 to 31 Seybold Desktop Communications Conference in San Francisco.

The Du Pont fiber optic LAN is modular and consists of a shielded cable assembly linking each computer or peripheral with an electrical/optical signal converter, into which optical cable is terminated. The Du Pont system converts normal electrical signals used by the Apple "Macintosh" and other "AppleTalk" devices to an optical signal, transmits it along optical cable, and returns it to its electrical form at its destination. The technology is transparent to the "AppleTalk" system and requires no software changes.

The Du Pont development makes the Apple "Macintosh" the first personal computer commercially available with a complete fiber optic local area network system. It is electrically and functionally compatible with the current copper twisted-pair LAN. The Du Pont system's modular design allows users to add fiber optic links to an existing copper wiring network or design one that is completely fiber optic. Compared with copper wire, fiber optic cable has a higher signal bandwidth, greater transmission range, improved data security and immunity to radio-frequency or electromagnetic interference (RFI/EMI). Fewer errors can result from systems noise. Signals can go further with less degradation.

One hundred stations, or more, each with as much as 4,900 feet apart can be linked, depending upon system traffic. This allows network designers considerable freedom to configure Du Pont's LAN between buildings, under floors and throughout walls. Fiber optic wall outlets provide connectors where needed. "AppleTalk" users can therefore change work locations without sacrificing LAN access. Because of its small dimension and light weight, fiber optic cable is extremely easy to install. Because only minimum building code requirements apply to optical cable, conduits and cable trays are not necessary, making routing easier and less expensive than copper cable.

Two configurations are possible: a point-to-point daisy chain link, or a star configuration using a Du Pont network concentrator. From a wall outlet, cable is routed to one of eight fiber optic or two electronic ports on the concentrator. The concentrator is designed for rack mounting in a typical central wiring closet and can be stacked in a series to accommodate additional network stations. System reconfiguration is merely a matter of switching cables on the concentrator panel.

Complete F/O LAN systems will be available at selected Apple retail outlets and directly from Du Pont. Du Pont supplies all components, cable and hardware.

Reader service inquiries should be directed to Robert R. Snyder, Market Development Manager, Du Pont Connector Systems, 515 Fishing Creek Road, New Cumberland, PA 17070, or call 1-800-932-7979.

Apple Provides
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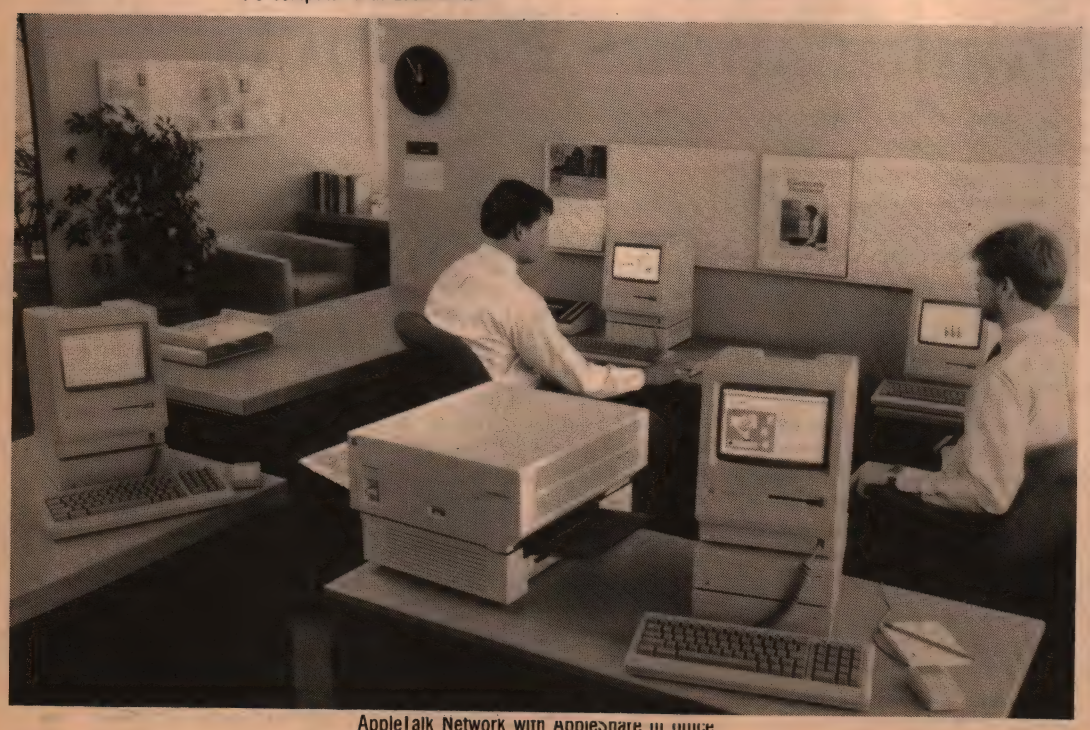
MSDOS word processing software for Macintosh computer family.

Apple Network Training Program

As an additional part of Apple's training and support program, the company has developed a Network Administrator's course to teach non-technical users or clerical personnel the routine tasks involved in operations and maintaining an AppleTalk Network on a daily basis. Because AppleTalk is so easy to learn and use the network administrator can maintain the system minimizing service calls. The two day course is being offered by many Apple dealers and sales representatives.

PC computer with LaserWriter



AppleTalk Network with AppleShare in office

AppleTalk Filing Protocol (AFP)

AppleShare is the first product to incorporate Apple's published standard for the AppleTalk Filing Protocol. AppleTalk is Apple's powerful network currently available, operating on a variety of cabling schemes including AppleTalk Personal Network cabling, twisted-pair phone wires, EtherNet, PBX systems or fiber optics.

LaserShare Print Spooler

Another of the new Macintosh communications products introduced by Apple is the LaserShare print spooler which offloads the LaserWriter printing queue to a server thus freeing individual workstations for other tasks and increasing users productivity.

Apple Computer Desktop Communications Products

AppleShare File Server. A workgroup file server—as easy to use as the Macintosh computer itself—that increases the productivity of workgroups by letting them simultaneously share information transparently, $799. Available now at dealers.

AppleTalk PC Card. A half-size, add-in printed circuit board for MSDOS personal computers that lets them access an Apple LaserWriter, $399. Available first quarter, calendar 1987.

LaserShare Print Spooler. Software that offloads the LaserWriter printing queue to a server, freeing a workstation for other tasks, $299. Available second quarter, calendar 1987.

Apple DCA Filter Software. A utility program that translates documents from MSDOS word processing applications to and from MacWrite, Apple's word processing software for the Macintosh computer family. DCA, Document Content Architecture, is IBMs standard format for word processing documents. No charge. Available with special release, second quarter, calendar 1987.

AppleLine 3270 File Transfer Software. A utility program for transferring files between the IBM 3270 mainframe environment and Macintosh via Apple's 3270 protocol converter, AppleLine, $99. Available second quarter, calendar 1987.

Network Administrator's Course. A two-day course to teach non-technical users the routine tasks involved in maintaining an AppleTalk Network on a daily basis. Available from participating Apple dealers. Student Reference Binder, $200. Available first quarter, calendar 1987. ●

Microsoft Unveils Network Strategy for Macintosh Applications with Release of Microsoft Word Version 3.0

Microsoft Corporation announced that Microsoft Word Version 3.0 for Apple Macintosh systems will take full advantage of Apple Computer, Inc.'s recently announced AppleShare network, making it the first word processor optimized for the Macintosh networking environment. Microsoft's support of AppleShare takes effect immediately with the shipment of Microsoft Word 3.0 and will be extended over time to other Microsoft applications for the Macintosh, such as Microsoft Excel, as part of Microsoft's networking strategy.

Microsoft has expanded its single-station restricted license to allow users the convenience and flexibility of running Microsoft Word for the Macintosh directly from a file or disk server. For every concurrent user who accesses the software, there must be a separate package.

"Microsoft believes office productivity is closely tied to connectivity. Microsoft Word 3.0 for the Macintosh was designed to work in a networked environment, and our intent to add AppleShare support to other Macintosh applications is a significant element of Microsoft's overall networking strategy," said Bill Gates, Microsoft chairman.

Microsoft's network strategy for the Macintosh reinforces Apple's framework for desktop communications. The benefits of connectivity and sharing information dramatically increases work group productivity. "Our close working relationship with Microsoft has resulted in the first word pro-

continued on page 213

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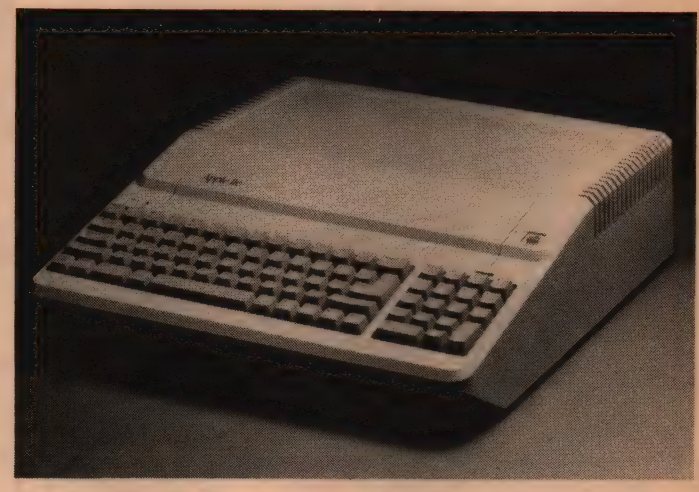


Apple Computer has demonstrated its commitment to the Apple II product family by introducing an updated version of the Apple IIe personal computer, the most widely used computer in U.S. schools. The updated IIe, which is available now, has an expanded keyboard with built-in numeric keypad, includes improved training and reference materials, and features Apple's new "platinum" color scheme.

Considered the workhorse of the Apple II product family, the IIe is the number one selling personal computer to elementary and secondary schools, and a popular choice for families with school-age children. Schools have purchased more than one million IIes since the computer was introduced in 1983.

The other members of the Apple II product line—the Apple IIgs and Apple IIc—are targeted at specific segments of the educational and consumer markets. The Apple IIgs, Apple's high-end flagship product, features a high-performance system with advanced color graphics and sound capabilities, fast processing speeds and large memory expandability. The Apple IIc, Apple's starter system, has a built-in disk drive, ports and connectors, optional memory expansion, and a compact case.

"The introduction of an updated IIe completes the revitalization of the Apple II product family that Apple began in September by launching the IIgs, a memory expansion module for the IIc and several new peripherals," said Del Yocam, executive VP and CEO of Apple. "Three strong systems give educators and consumers a wide range of price and performance options and establish a foundation on which the Apple II family can grow far into the future," he said.

A versatile, expandable architecture and the largest library of high quality educational software programs of any computer account for the popularity of the IIe in schools. The new IIe is completely compatible with all existing IIe software and peripheral equipment.

In kindergarten through eighth grades, IIes are used to help teach all subjects including reading, language arts, mathematics, science, social studies and computer programming. In addition, ninth through 12th grade students also use the IIes in areas such as computer science, business and vocational education, and for simulation exercises in social studies and science. The open architecture of the IIe also makes it ideal for specially-designed accessories that help students with disabilities learn and communicate more easily.

For teachers and administrators at all levels, the IIe is a low-cost workstation for classroom management, record-keeping, preparing instructional materials and their own desktop productivity applications. Since its introduction, the IIe has been a popular choice with independent developers, ensuring continual development of innovative software.

The IIe provides 128K of RAM, expandable to 1.2 megabytes (about 500 pages of text). Eight expansion slots accommodate a wide variety of accessories, such as floppy and hard disk drives, printers, modems, networks, memory expansion cards and co-processor cards, available from Apple and third parties. The IIe displays 40- or 80-column text, as well as graphics in three different resolutions and up to 16 colors, on a wide variety of monitors.

The IIe also provides a path to the most powerful member of the Apple II family, the IIgs. The Apple IIgs Upgrade Kit, which will be available soon, gives the IIe all the capabilities of the Apple IIgs while maintaining compatibility with more than 90 percent of the thousands of Apple II software programs available.

The IIes attached, typewriter-style keyboard has been redesigned to incorporate an 18-key numeric keypad, which makes entering numbers and performing calculations faster and easier. In addition, it has two programmable function keys, cursor-control keys and alphanumeric keys in the QWERTY layout. It generates all 128 ASCII characters, of which 96 are printable in upper and lower case. To facilitate upgrading, the IIe keyboard is functionally equivalent to the IIgs keyboard.

Like the Apple IIgs, the IIe now features Apple's new platinum product color scheme: a light grey case that matches Apple's line of platinum peripherals and darker grey keycaps and accents.

The IIe comes with an owner's manual, a guide to Applesoft BASIC and two double-sided training diskettes, all of which have been newly revised.

To simplify installation, the IIe is now shipped with the Apple 80-Column Card installed in the appropriate expansion slot. Previously the card was packaged separately and the user installed it.

The IIes suggested retail price remains at $829. The Apple IIgs Upgrade Kit will retail for $499 plus dealer installation. Educational institutions are eligible for special pricing, depending on quantities purchased. For more information contact Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010.

Mention that you read about it in *Computer Shopper*. ●

Ask The Guru

by Don Lancaster

Apple has just released a new version of the IIe. It is now packaged in a platinum color case and uses the Apple IIgs keyboard, including the numeric keypad.

A few other changes were made to reduce the production cost and standardize the use of Apple IIgs type components. Instead of eight 64K x 1 memory chips, you now have two 64K x 4 dynamic RAMS. And, instead of the pair of 64K monitor ROM chips, a single 128K chip is used instead.

The list price is $829, and dealer cost is something around half of that.

Except for the new numeric keypad and a newly introduced and very bizarre bug, the performance of the new Apple IIe should be identical to the older ones. The power supply might possibly run very slightly cooler, and a tad more power might be available for peripheral cards.

The bizarre new bug resulted from a change to allow mouse cards to automatically sense the shift key. If you have any peripheral that uses the SW2 input and if you simultaneously press the shift key, then you throw a dead short on the power supply, trashing everything currently in the machine.

Uh, Apple there is this product out there that has a linear voltage and current relationship and is able to automatically restrict currents to selected levels. You might not have heard of them, but these are called resistors, and they cost around half a cent each in production quantities.

Why, even IBM has made use of this emerging new technology. A complex set of math theory has also been developed and seems to stand up to experimental verification. It is known as Ohm's Law.

Apple has also dropped the EDASM assembler and their ProDOS Assembler Tools disk (#A2W0013) from the current developer services listings.

Apparently they feel that everyone is immediately supposed to shift to the new "C" language development tools and an assembler named ORCA/M that can handle the full resources of the 65C816.

Several readers have questioned the safety of toner cartridge refilling. While toner has not yet been shown to cause laboratory hamsters to become excessively horny, if you were purposely trying to develop a human lung carcinogen, you probably would pick a very fine black powder full of soot and fancy organic chemicals.

A little common sense is in order here. Do the refilling outside and in a slight breeze. Hold your breath or wear a mask when actually dumping the toner into the cartridge or emptying the toner holding tank.

For this month's contest, just tell me a cheap, local and no-nonsense place to buy specialty papers that are suitable for laser printing. Out here in Arizona, Paper Plus is the outstanding winner. What we need for a future column coverage is a nationwide listing of similar places. As per usual, a free Incredible Secret Money Machine to the best ten entries, and an all expense paid tinaja quest for two (FOB, Thatcher, AZ) to the overall winner.

So much is happening to Postscript this month that I don't even know where to begin. Sources close to the barber of an associate of a usually reliable spokesperson seem to feel that a major overhaul of Postscript is in the works and in the hands of some super secret developers. The new code is purportedly much faster, particularly with regard to character imaging and in the handling of downloaded bitmaps and similar images. Presumably the product will be retrofittable to earlier Laserwriter machines through a simple chip swap.

Here at *Computer Shopper*, we have already started a once-a-month listing of Postscript utilities, beginning with last month's column. Starting with this issue, you'll also find a Don Lancaster's Laserwriter Corner sidebar that will give you short and simple Postscript ideas and problem solutions that are ridiculously hard to find elsewhere.

There's also now a new national Postscript on-line

continued on page 108

Ask The Guru continued from page 107

bulletin board. It is open and free to beginning users. Advanced users can get the real goodies at a higher level on a "put one on, take ten off" basis. Commercial ads are placable here at a nominal charge.

All of the Postscript routines in this column will be available on this BBS on a downloadable basis, and I'll try to add some extra goodies of my own from time to time. The board is independent, so hacks and cracks should also be listed.

Oh, yes, the Postscript BBS phone number is 409-244-4704 and is up 24 hours a day. Standard baud rates of 300, 1200, and 2400 are acceptable.

There is also a new magazine called *The Postscript Journal*. This one looks like it is going to have some great goodies in it, but it is still too soon to tell. The cost is $15 per year to all charter subscribers.

Briefly turning to another of those insidious advertorials, my own unlocked and unprotected Postscript Show and Tell is in stock here for the Apple, Mac, and the IBM PC. Now newly available in an Introduction to Postscript user group videotape I put together that includes toner cartridge reloading, Kroy Kolor details, plus bunches more.

And the usual reminder that my Applewriter/Laserwriter Utilities and the complete set of reprints to this Ask the Guru column remain available. So are the usual free laser printing demo packs and other goodies.

We return you now to our program in progress...

What Apple Books And Manuals Are Available?

As I promised last month, Figure 1 is a listing of most of the current non-IIgs Apple and Macintosh books and manuals. Some of these are stocked by your Apple dealer, and others are distributed through Addison-Wesley. The Addison-Wesley titles are shown with asterisks in Figure 1.

Just about all of these should be directly available from the APDA people as well, who are a first rate source for all Apple technical information.

How Can I Use Older Disk Drives On The Apple IIgs?

The Apple IIgs has an incredible variety of disk drive options. For instance, there is a plug-in SCSI card that can access any number of floppy or hard disk drives that make use of this optional interface.

Then there are all the RAM disk plug-in card opportunities. Today, you could go as high as 8 megabytes of RAM disk. Just as soon as the prices drop a tad more on the 1 megabyte RAM chips, you can quadruple your storage to 32 megabytes.

In fact, you can do it today. One megabyte RAM chips are certainly available, but they are not yet cost competitive with older 256K dynamic RAMs.

And, should you attach a single "intelligent" drive to the usual DB19 disk connector on the IIgs, you can control up to 128 different drives at once. This would, obviously, take a beefed up power supply, but it can definitely be done.

Astoundingly, the present firmware (but not the drives themselves) is capable of supporting up to five gigabytes per drive, for the mind numbing total of half a terabyte of data on-line at once!

Which is not too shabby for a personal computer. Particularly since next year's CD ROMs should drop in just fine, thank you.

The normal and usual setup for most IIgs users is to daisy chain four dumb disk drives, placing a pair of 3½ inch drives nearest the IIgs, and using a pair of 5¼ inch drives as tail end Charlies.

The only little problem here is that the IIgs and all of the newer Apple drives use a DB19 connector. But, many of those older Apple drives used a 20 pin DIP header connector instead, that has wildly different pinouts. What can be done here?

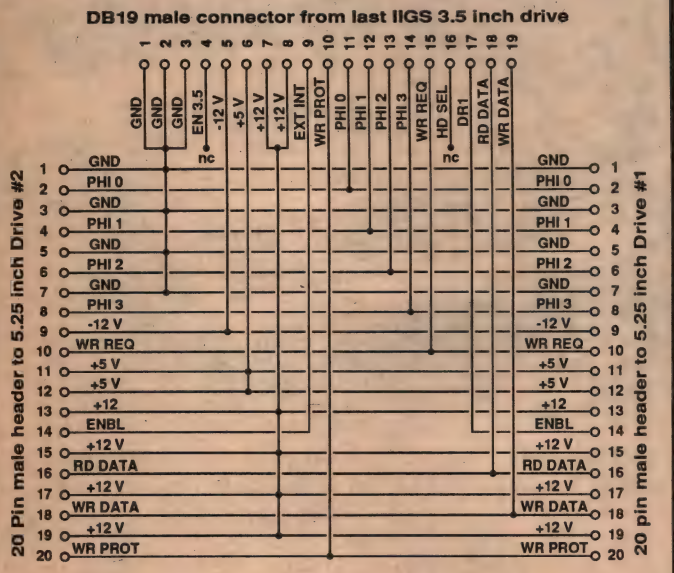
There are at least two ways you can use these older 20 pin drives on the IIgs. The quickest and simplest is to go ahead and use an old slot six controller card, and change the IIgs front panel selection to "your card" for slot six.

Instead, Circuit 1 shows you a simple adaptor that you can build that will let you connect a pair of older 20 pin drives to a single DB19 connector. This connector can either be plugged into the IIgs itself for a 5¼ inch only system, or else into the last 3½ inch drive in use.

This adaptor is certain to become commercially available soon, but for now, you might want to build your own. I would start with a small printed circuit board, being sure to use the type of 20 pin DIP header that has a plastic box around it.

Countless early Apple drive cards have been destroyed by plugging in a drive connector offset by one pin or even offset

continued on page 242



Circuit 1 - Apple IIgs old disk drive adaptor.

About your Enhanced IIe (030-1141)
Apple Color RGB Monitor Manual (030-3106)
Apple II Dot Matrix Printer Manual (030-0739)
Apple II Memory Expansion Card Man. (030-1209)
Apple II Monitor Users Manual (030-0598)

Apple II Mouse Users Manual (030-0243)
Apple II Numeric Keypad Manual (030-0463)
Apple II System Utilities Manual (030-2028)
Apple II Utilities guide (030-1264)
Apple IIc Memory Expansion Card Man (030-1330)

Apple IIc Owners Manual (A2L4038)
Apple IIc Owners Man & System Util (030-1030)
Apple IIc Scribe Users Manual Part 2 (030-0993)
Apple IIe Enhanced Owners Manual (A2L4073)
Apple IIe/IIc Color Monitor Manual (030-1224)

Apple IIc Mouse Manual (030-0961)
Apple IIc Reference Manual part I (030-0814)
Apple IIc Reference Manual part II (030-1022)
Apple IIc Technical Reference Manual (17728-5) *
Apple IIe Guide to the New Features (030-0622)

Apple IIe Hand Controller Manual (030-0200)
Apple IIe Joystick Manual (030-0563)
Apple IIe Numeric Keypad Manual (030-0564)
Apple IIe Technical Reference Manual (17720) *
Apple IIgs Manual (030-1292)

Apple IIgs Setup Guide (030-1294)
Apple II+ Vital Importance Manual (030-0209)
Apple III Dot Matrix Printer Manual (030-0740)
Apple III Monitor Manual (030-0193)
Apple III Read Me Manual (030-0662)

Apple Monochrome Monitor Manual (030-3110)
Apple Numerics Manual (17741-2)
Apple Personal Modem Users Guide (030-2001)
Apple 5.25 Drive Owners Manual (030-2040)
AppleColor Monitor Manual (030-0976)

Appleline Manual (030-0975)
Applesoft Reference Manual (17222-6) *
Applesoft Tutorial (17724-2) *
DMP Reference Manual (030-0607)
BASIC Programming (17721-8) *

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Hard Disk 20 Manual (030-1228)
Hard Disk 20SC Manual (030-3138)
Imagewriter II Appletalk Manual (030-1313)
Imagewriter II Owners Manual (030-2002)

Imagewriter II Sheetfeeder Ins. (030-2005)
Imagewriter Technical Reference Man. (17739-0) *
Inside Macintosh Volume 1 (17731) *
Inside Macintosh Volume 2 (17732) *
Inside Macintosh Volume 3 (17733) *

Inside Macintosh Volumes 1-3 Hardback (17737) *
Inside Macintosh Volume 4 (05409-4) *
Instant Pascal Reference Manual (17740) *
Language Card Manual (030-0217)
Laserwriter Owners Manual (030-1094)

Laserwriter Plus Manual (030-1292)
Lisa Cluster Controller Man. 1 (030-0611)
Lisa Cluster Controller Man. 2 (030-0667)
Lisa Motorola 16-bit Micro Manual (029-0055)
Mac 512K Enhanced Owners Manual (030-1326)

Mac 512K Disk Upgrade Manual (030-1327)
Macintosh Manual (030-0687)
Macintosh Plus Internal Drive Manual (030-1245)
Macintosh Plus Manual (030-1246)
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Parallel Card Manual (030-0371)
ProDOS Technical Reference Manual (17728-5) *
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SCSI Card Manual (030-3118)
SOS Driver Manual (030-0143)

SOS Reference Manual Vol 1 (030-0441)
SOS Reference Manual Vol 2 (030-0442)
Unidisk 3.5 Manual (030-1151)
Unidisk Owners Manual (030-0416)
Universal Parallel Card Manual (030-0255)

80 Column Text Card Manual (030-0408)

Fig. 1 - Apple technical books and manuals .

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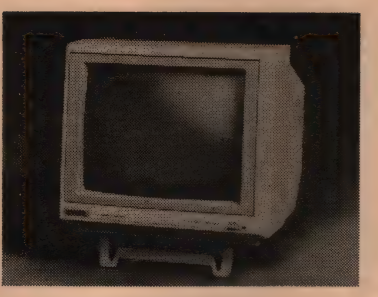

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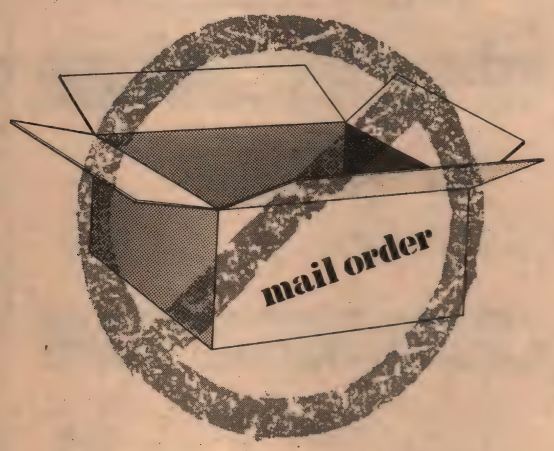

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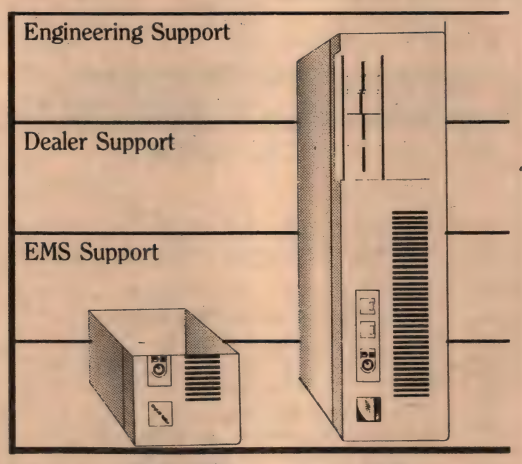

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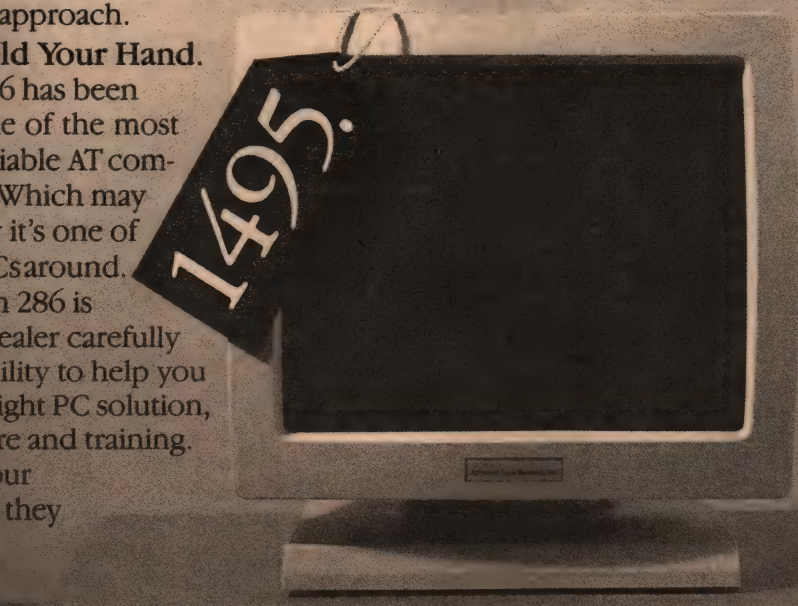

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ATARI

Applying The Atari

by Jeff Brenner

This month's program is a utility designed especially for the BASIC programmers. Automatic Voice Silencer essentially adds an extra parameter to the Atari BASIC SOUND command, allowing you to specify a length of time for the given sound. We've also got reader mail and newsletters.

Reader Mail

Dear Jeff,

Recently I have decided to undertake a hardware project. As I have some questions, I thought that perhaps you can answer a few.

I have an Atari 800XL with BASIC Rev. B but I would like to change the BASIC Rev. B ROM chip on the motherboard to the ROM chip with BASIC Rev. C. Since I already have BASIC Rev. C in cartridge form, I can remove the chip from the small PC board by desoldering it. I then hope to remove the ROM chip on the motherboard that has BASIC Rev. B and put in its place the ROM chip with BASIC Rev. C. I realize that I may have to desolder the chip on the motherboard, but I am confident that I can perform the desoldering because I have done delicate and careful desoldering before. I have two questions concerning this project. The first question is whether ROM chip Rev. B is electrically compatible with ROM chip Rev. C? The second question is whether ROM chip Rev. B is pin compatible with ROM chip Rev. C?

J. V. Martinez
Los Angeles, California

Since we can plug either a B ROM BASIC or a C ROM BASIC into the cartridge port, it is safe to assume that the two are electrically **and** pin compatible (the ROM chips are wired or plugged into a standard cartridge shell). The only difference between the two is the data contained within the ROM chips, and this data merely serves as a program that the Atari will execute.

I should warn you, however, of the possibility of damaging either a ROM chip or the circuit board, particularly since you mention desoldering—so do exercise caution if you intend to proceed with your project. Of course, if the chips are socketed (as might be the case with older cartridges and Ataris) you're in luck since you should be able to pull the old chips out and replace them without the need to desolder.

Personally, I probably would not bother replacing the ROM chips and would instead leave the C ROM BASIC in the cartridge port (the Atari would then run the C ROM BASIC instead of the B ROM after powerup), but if you are intent upon making the chip swap, then good luck.

Dear Jeff,

I'm very curious to see how the checksums used with Program Perfect are generated. I didn't spend an incredible amount of time trying to figure it out, but to no avail anyway.

Larry White
Mooresville, Indiana

The Program Perfect codes are generated by first summing up all of the characters on a line. The resultant sum is then converted into a two character code based on the letters of the alphabet. A third character tells Program Perfect where the next line is for the automatic line numbering feature. (If the third character is a "J," as it often is, this means that the following line is 10 away from the previous, since J is the tenth character of the alphabet). The last line of a program contains a "Z" as the third character in the code. When you later enter these codes, the "Z" tells Program Perfect that the entire program has been entered.

One question I've received a number of times is, "Is Program Perfect really perfect?" and my answer is "No." No proofreading program could be absolutely perfect unless the codes it used were as long as each program line itself. With a three character code (actually a two character code and a line numbering code) there is always a possibility that an incorrectly typed line can contain two errors that "cancel" each other out and result in the correct code. With Program Perfect, this can occur if two characters are transposed, since character position is not taken into consideration when the code is being generated. In most instances, the result would be a syntax error (i.e. **PIRNT** instead of **PRINT** would be caught by the program for the syntax error rather than for a code mismatch). However, characters transposed within a string or on data lines will not be spotted by Program Perfect, so these should be entered carefully. Ideally, Program Perfect would combine a position code into the checksum so as to catch these transposition errors, but changing the coding procedure at this point would only cause mass confusion among those using Program Perfect (particularly among newsstand buyers who might miss the issue containing the update).

You'll find two programs that will take a BASIC program LISTed to disk (i.e. LIST "D:TEMP" and print it along with Program Perfect codes. The listing under "Program Perfect Coder" will work with any printer, while the "Program Perfect Coder 2" listing will work with Epson/Gemini/Star models. The second version prints a centered title and automatically advances the page when necessary. With minor modifications, character position can be added into the coding (for example, line 70 could contain T = T + ASC(D$(I,I)) + I) or the coding procedure could be modified to utilize numbers in addition to letters, or to incorporate an entirely new method of coding. Remember, though, that any changes made to the coder must be made to the corresponding "Program Perfect" (or other typing checker) so the two will remain compatible.

April Fools'

Undoubtedly, many of you have been patiently waiting for the living-cell, biologically interfaced 85-megabyte organic memory expansion project with intelligent decision-making capabilities. While I might have made some of the folks at IBM a bit nervous about what I was going to reveal, we don't have room this month for the project. Do you believe that? Maybe next April.

Newsletters

From the Lake County Illinois Atari Computer Enthusiasts comes the L.C.A.C.E. Newsletter ($15/yr, P.O. Box 8788, Waukegan, IL 60079-8788). The January issue contained a number of reviews, news from the fall Comdex, and a section for the ST. Does your group publish a newsletter that we haven't seen yet? If so, send it in!

Automatic Voice Silencer

The Atari computer has the ability to generate sound independent of the actions of its 6502 processor chip, since sound generation on the Atari is controlled by separate circuitry. A sound that is turned on will remain sounding until it is forced off with another sound command (i.e. SOUND 1,0,0,0 silences voice 1). This independent sound generation offers many advantages since the computer can perform other operations while a sound is on. For example, the action in a game does not need to be interrupted to continously generate a sound, thereby allowing faster and smoother game play. Or a music program can sound notes while it is reading data for the next notes to be sounded, or loading data to be drawn on the screen.

Despite the advantages that the Atari's sound generation offers to the programmer, the fact that the sound must be turned off by the program can be a serious inconvenience. A BASIC programmer, for example, must somehow keep track of the length of time a sound is being produced, and then turn the sound off after the desired duration. This often involves placing a FOR-NEXT loop after the sound statement (i.e. SOUND 1,25,10,8:FOR I = 1 TO 30:NEXT I:SOUND 1,0,0,0). But by doing this, the programmer is defeating the purpose of the Atari's independent sound registers, since the computer is effectively tied up until the loop has ended. The computer could be doing other tasks while this sound is being made, but then the programmer can have a difficult time finding a place in the program where the sound could be turned off after a given amount of time.

The subroutine in this article eliminates this problem by allowing you to specify an amount of time a sound is to continue sounding. After the specified amount of time has elapsed, a machine language routine automatically turns the sound off.

How It Works

The subroutine in lines 30000 through 31070 stores a machine language program in memory. This machine language program is set up as part of the Atari's Vertical Blank routine. This allows the program to constantly monitor and control the computer without interferring with the program the computer is running. Thus, it is able to turn any of the Atari's sound registers off at any time. The program uses memory location 204,205,206 and 207 ($CC, $CD, $CE and $CF) as counters to determine when to turnoff a sound register. Location 204 is the timer for sound register #0; location 205 is for sound register #1; location 206 is for sound register #2; and location 207 is for sound register #3. Another timer, at location 203 ($CB) is used to count at a rate of ten times per second. Each time locations 204 through 207 are changed, location 203 should be reset to zero (with a POKE 203,0).

Using The Automatic Voice Silencer

Before using the Automatic Voice Silencer, your BASIC program must first GOSUB 30000. This subroutine will load the machine language routine into the computer's memory. It is necessary to GOSUB to this line only once. From then on, locations 204, 205, 206 and 207 can be used to time sounds. Before any sound statement that you wish to time, do the following:

1) Determine the time period for which you want the sound to continue. The time must be specified in tenths of a second. You can use any time from one to 255 tenths of a second. If you wish to specify eight seconds, for example, you would use eight times ten, or 80 tenths of a second.

2) POKE location 204, 205, 206 or 207 with this time. The voice number producing the sound determines the location which must be poked (thereby allowing each voice to be controlled independently.)

SOUND STATEMENT	USE LOCATION
SOUND 0,0,0,0	204 (POKE 204,T)
SOUND 1,0,0,0	205 (POKE 205,T)
SOUND 2,0,0,0	206 (POKE 206,T)
SOUND 3,0,0,0	207 (POKE 207,T)

3) POKE location 203 with a zero. This resets the program's main timer (POKE 203,0).

After these steps, your sound statement(s) would follow.

Entering The Program

Type in the listing under the "Automatic Voice Silencer" heading using Program Perfect and LIST it to disk (i.e. LIST "D:VOICE") or cassette so you can ENTER it later to merge it with your BASIC programs.

Now enter the Demonstration program (lines 10 through

continued on page 258

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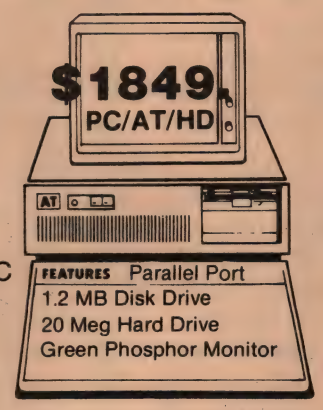

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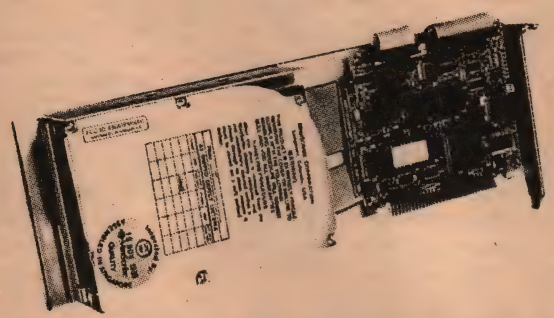

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ATARI ST

GFA BASIC for The ST

by John J. Anderson

I'm one of those people who think that BASIC has gotten a bum rap. It is, of course, the programming language I learned first, and arguably best (simply by exposure), and I am by no means an assembly whiz or C protege. For my kind of dabbling, BASIC has long been a comfortable place to be.

Unfortunately, it has never offered the kinds of capabilities to be found with other programming languages. It has been slow, weak, unable to hook into the strongest facets of a machine—programs written in BASIC have a tendency to telegraph themselves in the worst ways. Know what I mean? "This is so bad, it must be written in BASIC," you may occasionally find yourself saying to yourself.

Even worse, and largely responsible for the notorious reputation (or perhaps I should say "lack of") displayed by the BASIC language has been the nearly barbaric programming conventions it seemingly encourages. Certainly sloppy programming and damnable coding habits are ultimately the responsibility of the programmer himself, and no one else. But BASIC undeniably tempts the holiest of the holy—with its line numbers, its untaggable variables, and its lowly desperado of a command, GOTO. In a showdown, GOTO will plug you first every time.

I call myself a BASIC fan, yet I'll freely admit that if called upon to decipher some code, I'd rather look at Pascal or Logo hands down. Maybe even LISP, if I'm feeling frisky.

Why is this? Because languages such as Pascal are "structured," that is, designed to encapsulate code routines in separate modules, callable by some logical name, and much easier to understand in a much shorter period of time. There are no line numbers (at least that the programmer need concern himself with) and no GOTOs. Rather there are procedures and procedure calls. When reading someone else's code, you can see paths quickly. When writing your own code, you don't need to leave a trail of breadcrumbs to retrace your steps. Neat.

It should be noted that there has been somewhat of a backlash against Pascal in recent months, and I do understand it. Pascal forces you to declare yourself in Pascal's own terms, to put all your cards on the table right at the beginning, as it were, and to think the way Nikolas Wirth thinks, if you intend to get anything substantive done. In its desire to keep you clean and coding on the right track, it constricts you, and this may inhibit inspiration. David Small, longtime Atarian whose latest venture is the Macintosh Emulator Magic Sac, has called Pascal "a Fascist language." A tad overstated, perhaps, but I can certainly see where he is coming from. In its own way Pascal is almost as bad as Cobol, in respect to the requirements of even the simplest of jobs. Sometimes you need to cross a ravine and what you want is a strong plank—you don't need a suspension bridge every time.

But let me remind you, I am not a programmer, I am a writer who programs as a hobby. And I am one of those people who think that BASIC has gotten a bum rap.

Billing itself as "the full access" BASIC programming language for the Atari ST series, GFA BASIC, from GFA Systemtechnik in Germany, fulfills that promise better than any other ST BASIC I have seen to date. It has hooks into most of the powerful features of the ST, and is quite fast (more a reflection of the ST's 68000 processor than anything else). It is possible to write a program in GFA BASIC that in no way telegraphs the fact that it is not written in C, or Forth, or assembly. Huzzah. It lists for $79.95. Double huzzah.

What's more, GFA BASIC is a structured BASIC. It sports no line numbers, and though it does feature a GOTO statement, you can hold it in abeyance, rather like the Hyperspace button on an arcade game. If your back is to the wall, and there's no other way out, your old buddy GOTO will shoot you out of there in no time. But he leaves your code a messy place. Better bring a mop.

In addition to the fact that GFA BASIC supports procedures, it allows exactly and only one command per line. This may seem like a throwback, and I can tell you that it does take some getting used to. But if memory is not a problem (and on the ST it is not, or at least should not be a problem), the approach results in code that is much easier to follow. Sure, your listings are a lot longer than they would be with multiple command lines. But at the same time, they are much less dense. It is less likely that you will miss something salient as your eye scans a chunk of code. And what may have seemed like a constraint at first quickly evolves into a programmer's aid, once you ease into it.

The editor within GFA BASIC has its nuances, but on the whole is a pleasure to use. It is what I call a "real-time" editor: that is to say you can change the code on a line, click RUN, and watch the modified code execute. There's no pressing of RETURN to enter a line, or a Byzantine windowed entry system as presented by Microsoft BASIC for the Mac. Simply make your alterations and go. Insert, delete, block move and copy, search and replace, all work exhilaratingly well. True, marking blocks and manipulating them is a two-step process, and can seem a bit awkward. Paging does not work window-style, either, but with mouse clicks on the menu bar, which is a little distracting, at least to start with. But the editor is smooth, robust, and powerful. It includes a large set of cursor movement commands. It allows you to flip between the editor and display screens, to see the results of your code upon it. It allows you to toggle between insert- and overwrite-style input. It even features a pseudo-direct mode, where commands can be entered command-interpreter style. TRON and TROFF commands there aid in debugging code.

Error messages in GFA BASIC are always full-text,

continued on page 120

Hacking The ST

by Wynn Rostek

This month, I'll tell you a little about the way the 68000 CPU is built, at least as far as the programmer views such things. Let's take a look at a typical 68000 assembly language instruction.

```
load: move.w #scrrez,d0 * find resolution
```

This line of assembly language code is known as a statement. The first part of the statement, for those of you new to assembly language programming is called a label. Labels allow you to refer to things symbolically. If you wanted to run the subroutine that started with the above line, you would use:

```
jsr     load
```

The assembler will figure out the address of the instruction that started with "load" and would substitute that value in the jsr load instruction. This has to happen because all the CPU understands is memory addresses, it has no idea what "load" is, it insists on having an address.

The label portion of a statement is optional. If you never need to refer to the rest of the statement that appears on a line, there is no need to include a label as the first element.

The second part of the statement is the mnemonic. This is either a instruction that the CPU can perform like move, or add, or it could be a directive to the assembler program like page or title.

You should have noticed (if you have been reading this column, or have seen 68000 assembly language elsewhere) that the mnemonics for the 68000 often end with a .b or a .w or a .l. These endings specify the size of the data object we are working on.

Any instruction ending in .b refers to a byte or an 8 bit quantity. A .w ending means we are working with a word or 16 bit quantity. The .l ending specifies a long or 32 bit quantity.

After the mnemonic comes the operands. Operands are arguments used by the assembler to build the complete machine language instruction. If we encounter the mnemonic move.b, we already know that we are going to move 8 bits, but the question is where do the 8 bits come from and where do we move them to?

In the case of the move instruction, the operands tell us where the data comes from (the source) and where the data ends up (the destination).

The operands are separated by a comma. Following the operands is a comment. The rules for where comments start vary from assembler to assembler. Some assemblers allow anything following the operands to be a comment. Others require a delimiter to notify the assembler that a comment is starting.

The assembler that comes with the developers package uses the "*" character to denote the start of a comment. Almost all assemblers agree that comments stop at the end of the line.

You will notice that many of the instructions in the 68000 use 2 operands data, they also can use 2 different addressing modes in a single instruction. In fact, most of the 68000 instructions use two operands and can use two different addressing modes. Because most instructions have 2 different addresses in them, the 68000 is called a two address machine.

As an aside, the 2 address machine is the most popular now in terms of number of CPUs using it, but there are 3 address machines, 1 address machines and even 0 address machines.

While there are not many 3 address machines around, a compiler often generates 3 address instructions (called quads because there are three addresses and one operation) and then translates the three address code to actual instructions for the target CPU.

A 0 address machine is a stack machine (perfect for running Forth). Almost all operations push or pop values off of the stack to get the work done.

Even a 0 address machine needs to have a few single address instructions. Whether a machine is 2 address or 1 address or whatever depends on the most common instructions in it's instruction set. If most of the instructions are 2 address instructions, then it is a 2 address machine even if it has some 1 address or 0 address instructions.

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GFA BASIC
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and usually point you directly to the problem. The interpreter is quite "smart," and can often accept a line that has been entered incorrectly, fixing the mistake as it goes (as long as the mistake is a minor one). As an example, a line you enter as ?at (2,2) "Test" will click in as Print At (2,2); "Test" and execute correctly. Insertion of the semicolon was especially impressive to me. Even when your code results in a crash, BASIC will tell you how many bombs your ST has returned and what they might mean to tell you.

The function keys on the ST are fully enabled by GFA BASIC, and can shortcut point and click commands to load, save, save in ASCII format, merge, list files to a printer, flip between screens, go to direct mode, test program loops, run a program, or quit.

GFA BASIC's command set is extremely complete, and we don't have the room here to list them all. Suffice to say that you won't find it lacking any command you want to use, and in fact will discover it is replete with commands you didn't know you needed, but will happily learn to use. Among these are commands for graphics, sound, menus, windows, mouse, machine code calls, drive control, time and date, directories, file manipulation, various input formats, a wide range of loop formats, string handling (ala Microsoft), error trapping, I/O channels, peeks and pokes, screen manipulation, READ-DATA manipulation, pointers, and traces. Special functions include VDI and AES calls, including window control through GEM, the capability to pass on variables and arrays indirectly, a raster copier command, fast movement of memory blocks, monitor calls, and true and false conditions.

The EXEC command allows you to load and execute a non-BASIC ST application and run it from within a GFA BASIC program. The C: command calls and runs a routine written and compiled in C.

Variables can be in the form of single letters or words, and the full word is always used by GFA BASIC to distinguish between variables. If a value is assigned with the LET command (optional, of course) then even command names are allowed as variable names—you can say LET LET = 17, and it will happen. Real, integer, Boolean, and string variables are supported. Significantly too, local variables are also supported.

Included on the disk with GFA BASIC is a program that strips line numbers from ST-BASIC programs for conversion to GFA BASIC. The program helps show you where you'll need to do some custom tailoring. Also on the program disk is a run-only version of GFA BASIC, which is a quasi-compiler. It allows you to run GFA BASIC programs as stand-alone applications, and GFA Systemtechnik invites you to copy the run-only module at your pleasure. My informal tests showed no appreciable speed difference between the actual program and the run-time compiler—but this was only because both were so fast.

So it becomes clear that GFA BASIC is an excellent program, and an excellent programming language. It brings BASIC to the ST in a manner truly worthy of the machine. In fact, it could be said that GFA BASIC is the only BASIC programming language yet released that presents a good, strong argument for programming an ST in BASIC in the first place.

That is not to say that it is entirely without its disappointments. The documentation comes from the German, and suffers badly from "translationitis," wherein quotes are called "inverted commas" and the like. In places it is verbose about a simple point, in other places terse about complex ones. It transposes bars for slashes, ohs for zeros, the words TEST and TEXT, and then there are the simple typos in program code. I fear that the documentation accompanying GFA BASIC will hinder its deserved acceptance as the de facto BASIC language for the Atari ST, as it camouflages the elegance and ease of use of the package.

Then there are the problems of hooking into GEM. These cannot fairly be placed at the feet of the people at GFA Systemtechnik—but in their efforts to bring the power of the ST to the commonfolk, they get caught in the middle. Simply opening and updating a movable window on the ST is an exercise in the complexities of GEM (see example in accompanying program). But perhaps I am revealing my own deficiencies in this comment, rather than those of the systems I describe.

Listing 1 is a program I worked up that demonstrates the capabilities of what I believe to be the most interesting commands of GFA BASIC. The goal is to demonstrate some of those capabilities, and to provide a tutorial for new users. This listing is available online through Compuserve and Delphi, along with the run-time package. By downloading the files you can have a look at GFA BASIC in the comfort of your own home, and perhaps get a hint of whether or not it is something you would like to purchase. I have annotated the program here (note that you won't be able to list the program with the run-time package).

What the program does is throw a menubar on the screen, offering selections for Intro, Windows, Mouse, and Graphics. You can pick and choose through these selections, and run through demonstrations of various commands. The following is a summary of the program itself:

The first module of the program defines the menubar and displays it on the screen. It initializes a text string (Bar$) which will contain all the elements of the menu, and uses READ and DATA statements

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Hacking The ST
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Well, the time has come to cover the 68000 addressing modes. The 68000 is a very powerful CPU, and one of the things that makes it so powerful is the instruction set, and a good portion of that power is a result of the different addressing modes it can use.

It might seem a little strange to devote a column to the addressing modes of the 68000, but you cannot really wring the last ounce of performance out of your ST unless you can write in 68000 assembly language, and to write in 68000 assembly language, you have to understand the addressing modes.

If you are saying to yourself right now, "What is an addressing mode?" you are not alone. Many people that have been casual programmers have never heard the term before.

When you are writing in assembly language, there is no compiler or interpreter to keep track of where things are kept in the machine's memory. You have to keep track of where everything is yourself, and somehow let the CPU know also.

There are basically two places that data can be stored as far as the 68000 is concerned, in a CPU register or somewhere in memory. If there are only two places to store data, why do we need addressing modes?

In programming, you often find yourself doing the same kind of job over and over again. As an example, imagine you are stepping through an array of data looking for a certain value. Your array of data is stored in the memory of your computer somewhere so all of the addresses you use when looking through the array access memory.

To illustrate the power of a good set of addressing modes, let's assume your array contains 10 integers and it starts at location 100. The value we are looking for is −1. Your first cut at code to search the array for this value might look something like the code in Table 1.

The move instruction should be obvious, the cmp instruction compares the two operands, and sets some flags based on the result of the comparison. If the two things being compared are equal, then the zero flag is set.

The beq instruction is a conditional branch. If the zero flag (one of the flags the cmp instruction can set) is set then the program jumps to the new address (found) but if the zero flag is not set, the CPU just executes the next instruction after the beq.

After looking at this for a short time, you will no doubt want to change it into a loop so that the job is done with far less code. Your first try at a loop might look something like the code in Table 2.

The first code segment uses immediate addressing, that is we tell the CPU where in memory to find the item by specifying the full address each time we get the value we want to look at. The first value comes from location 100, the second from location 102, the third from 104, etc.

In the second code segment we use address register indirect addressing so we can search the array with a short loop. Instead of specifying the memory address each time, we keep the address in register a0. After loading the value, we increment the contents of register a0 to point to the next value.

A third, and even better way to code the loop is presented in Table 3. This code segment uses address register indirect with post-increment addressing

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```
move.w    #100,d0     * get value 1
cmp.w     -1,d0       * see if we found it
beq       found       * got it...
move.w    #102,d0     * get value 2
cmp.w     -1,d0       * see if we found it
beq       found       * got it...
move.w    #104,d0     * get value 3
cmp.w     -1,d0       * see if we found it
beq       found       * got it...
move.w    #106,d0     * get value 4
cmp.w     -1,d0       * see if we found it
beq       found       * got it...
move.w    #108,d0     * get value 5
cmp.w     -1,d0       * see if we found it
beq       found       * got it...
move.w    #110,d0     * get value 6
cmp.w     -1,d0       * see if we found it
beq       found       * got it...
move.w    #112,d0     * get value 7
cmp.w     -1,d0       * see if we found it
beq       found       * got it...
move.w    #114,d0     * get value 8
cmp.w     -1,d0       * see if we found it
beq       found       * got it...
move.w    #116,d0     * get value 9
cmp.w     -1,d0       * see if we found it
beq       found       * got it...
move.w    #118,d0     * get value 10
cmp.w     -1,d0       * see if we found it
beq       found       * got it...
bra       gone        * it's not there
```

Table 1.
Searching an array, a primitive approach.

```
top:
move.l    #100,a0     * start of array
move.w    (a0),d0     * get a value
cmp.w     -1,d0       * see if we found it
beq       found       * got it...
addq.l    #2,a0       * next array entry
cmp.l     #120,a0     * array all done?
beq       gone        * end of array?
bra       top         * more to do
```

Table 2.
A loop to search an array.

```
top:
move.l    #100,a0     * start of array
move.w    (a0+,d0)    * get a value
cmp.l     #120,a0     * array all done?
beq       gone        * end of array?
cmp.w     #-1,d0      * see if we found it
beq       found       * got it...
bra       top         * more to do
```

Table 3.
A shorter loop to search the array.

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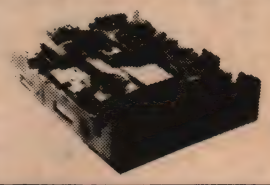

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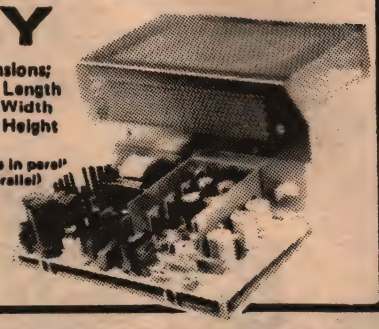

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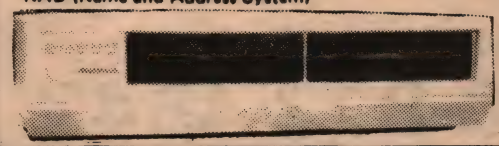

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COMMODORE

Inside Commodore

by Ted Drude

Some of you who are regular readers of this column probably have wondered if I had fallen off the end of the earth. Well, I didn't. But, I was quite busy for a couple of months taking a new job and moving across the country. Now that things have settled down here a little, let's get back on track. This month, I've got several short reviews of some good Commodore 64/128 products for your consideration.

GEOS Programming Books

In the past few months, several new programmer's reference guides for the GEOS operations system have started appearing. Both Abacus Software and the Midnight Gazette have been selling books since last Christmas. Two other volumes, both of which I have been using, also have quite a bit of good information in them.

Alex Boyce's Shareware GEOS Manual

The first GEOS programmer's reference guide that I ran across was written by Alexander Donald Boyce. This very excellent book was done by Alex without any help whatsoever from Berkeley SoftWorks (BSW). He completely disassembled GEOS, studied the listings, and then wrote his manual based on that experience. Quite an undertaking!

The book is an excellent reference guide to all the GEOS KERNAL routines, device drivers, file formats, memory maps, and other information. Understood on that level, it's a very useful and practical book, but it leaves a lot of questions unanswered for the beginning GEOS programmer. It's major weakness is a lack of any practical programming tutorials. It's not a how-to-do it volume. Rather, it's a serious reference manual for experienced assembly language programmers who are already familiar with the basics of GEOS.

In order to get his book in wide circulation quickly, Alex uploaded the complete formatted text to QuantumLink and gave the book away as Shareware. (You can find full information on this effort on Qlink's GEOS Forum.) To download and print out the manual will probably run you about $15-20 (for connect time to Qlink, a new ribbon for your printer, and paper). It will also probably take several hours, unless you take it to a printer to be printed on a laser printer, which is more costly but much quicker.

Anyway, as I now understand it, Alex will also send you a pre-printed copy of the book, along with a disk of example programs, for about $15. While it might take a few days longer by ordering a printed version from him directly, it should be cheaper (and Alex will get most of the profit, instead of Qlink). Alex's address is at the end of this article for your convenience.

Berkeley SoftWorks, *OFFICIAL GEOS Programmer's Reference Guide*

The second GEOS manual I've been working with is the new official version from BSW, which has just been published by Bantam Books. For only $19.95, you now have the (supposedly) straight info from BSW. Actually, it's a pretty good book. While it, too, suffers from somewhat of an expert, guru, hacker orientation, it's still a much more practical volume for learning how to write programs for GEOS.

BSW assumes that readers of their GEOS manual are already familiar with the C-64 environment, and know 6502 assembly language pretty well. If you are in that category, you'll do well with the BSW manual. If not, you will still need to brush up first with other general C-64 programming books.

Overall, I'd rate the BSW manual as good to very good for a first, rushed effort. While it was written primarily by programmers for programmers, it's still readable by non-gurus. There aren't any glaring typos that I've found and it seems to have originally been written from an outline that existed somewhere at sometime. Some of the chapter divisions seem rather arbitrary (like inserted after the text was already written) and the authors tend to ramble on some at times, but overall, it gets its points across effectively.

Most importantly of all, it includes several complete programming examples, including complete listing of GEOS input device and printer drivers. Those are the most valuable parts of the manual to some readers (like me...PPD drivers for GEOS are on the way!) If you are already an expert on the C-64, and need a guide to get into GEOS programming, this manual should be just the ticket. You should be able to find this book at most larger bookstores, by mail order, and at some Commodore dealers, but I've included Bantam's address at the end of this article for your convenience.

Schnedler Systems' Symbol Master Disassembler

One software product that you may have seen advertised, but not read too many magazine reviews about is Schnedler Systems' Symbol Master. I can't tell you why this program seems to be such a secret. I've been using it for quite a while, and have come to like it more and more. For casual perusal of commercial software, extended software analysis, or just general hacking around, I don't think it has many equals in the Commodore world. In fact, Symbol Master is of the quality and type of product seen more often in the MSDOS or CP/M world, but at a much higher price.

Symbol Master is a professional level symbolic 6502 assembly language disassembler. For those of you who are unfamiliar with symbolic disassemblers, you may not understand what some of their advantages are. When you want to study an assembly language program that's in binary form, you first have to try and recreate the original source code. The traditional approach is to use the disassembly features of an ML monitor program, like Supermon or Micromon to produce a rough disassembly on a paper listing, and then analyze the results by hand. (Don Lancaster had an excellent series of articles on doing this kind of hand 6502 disassembly a couple of years back in his Ask the Guru column.)

But, this hand analysis/recreation task becomes rather difficult if the program is of any length. You have to make up new symbols/labels for all the program entry points, subroutines, branches, etc.

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Rumors End, More Letters, More Info

by Cheryl Peterson

Despite dire speculations that Commodore might discontinue the 128, Commodore announced a newer and improved C-128 at the CES show in Chicago a while back. *Computer Shopper* ran an article on the improved machine's announcement in last issue. For me, this was welcome news as I still think the C-128 is a good computer for home users. I really like the look of the new C-128. With the monitor mounted on top of the main CPU and disk drive, it takes up a lot less room on the desk. With my Osborne I've long enjoyed the ability to put a keyboard in my lap instead of being bound to the desktop with it. The detachable keyboard on the new C-128 should be very attractive to buyers.

Along with the news of the improved C-128 and Commodore's release of the PC10 computers, came word that the company made money again in the fiscal quarter that ended in December. That's the third quarter in a row that Commodore has made rather than lost money. With the many quarters that they lost money, they should be just about even now. I certainly hope they continue their money-making trend.

Oh, yes, Commodore also announced two new Amiga computers. One, the Amiga 500, is a cheap version to be sold in discount and toy stores. The other, the Amiga 2000, is supposed to be an improved Amiga 1000. But I imagine *Computer Shopper's* Amiga writers will have more to say about the new machines very soon.

FOGgy Again

The January issue of *FOGHORN* had quite a bit of good inforation for C-128 owners. One article dealt with speeding up WordStar by patching it. The patch is easy to do and reduces the lenghty load time on the C-128 quite a bit.

Also, the new CP/M operating system, the December 6, 1985 revision, is available through the FOG library as Disk #CPM.121. This version properly supports the serial port allowing use of a modem or serial printers. If you have the Digital Research Manual you can assemble it yourself or use the assembled version already on the disk. Disks are $4 for members, $8 for non-members. The decision to sell FOG disks to non-members is a recent one.

Disks sell for $4 if less than 10 disks are ordered, $3 for 10 or more disks. This is the price for members. Non-members must pay double that. Also this price is for double density disks. If you need single density, the price is doubled since two disks must be sent for each one ordered. FOG offers a few disks of special interest. To find out what programs are available through the library order the Library Catalog disks. A Starter disk with some of the best programs in the public domain is available, as well as a modem disk for telecommunications. Specify what computer and modem you are using when ordering the modem disk.

Membership in FOG is still only $25 and includes 12 issues of the *FOGHORN*.

If you'd like to feel really good about buying a CP/M computer, a *FOGHORN* ad from J&D Associates will interest you. It offers Microsoft's BASIC compiler in CP/M format at $49.95 and Fortran for $29.95. The MSDOS versions are $295 and $275 respectively. Anyone who'd like to try out TurboPascal might want to get a copy from them at $59.95. Shipping is $3 or 3% of the order price.

Another article in the January issue is called C-128 - Commodore's Best Friend - The FOG Library. The article contains instructions on using FOG's RCPMs to download software.

Another article that surprised me was Connecting an Amiga to a Modem. I guess it is true that FOG supports all computers.

CP/M Software For Sale

While new CP/M software is still almost non-existant, I have noticed a couple more vendors

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Getting The Most From Word Writer 128

by Patrick A. Tillery

A recent letter to our CP/M column complained about not being able to get the most from Word Writer 128. WW128's documentation, although better than most, does leave a few blanks so perhaps some tips are in order. Word Writer 128 and its brothers: Data Manager 128, Swift Calc 128, Partner 128, and Sylvia Porter's Personal Finance, while not the most powerful, are probably the easiest to use of any available. Nearly everything is accomplished through the "pull down menus," but as you get more comfortable with the program, you can bypass them with the "Quick Commands." Actually, I recommend that you do just that—use the menus until you get comfortable with them; then the "Quick Commands" will come naturally. There are, however, a few things that are not covered in the documentation:

1. Where do you align the paper before starting to print? The top line of your page must be right under the print pins for the first line because that is where WW128 starts counting; otherwise headers, footers, and page numbering are likely to print on the wrong page.

2. Centering and right aligning is done based on the line length setting under the print menu—**NOT** the line length set up with the check command. These two line length settings, however, should normally agree. If you change one, change the other.

3. You must consider the whole page when setting your top and bottom margins. The standard page lengh is 66 lines. The sum of your top margin, bottom margin, and "Page Length" under the Print Menu must total 66. Actually, "Page length" is a misnomer; it should be "Text length."

4. One of WW128's weaknesses is that it is only designed for single line headers and footers. Almost all serious writers as well as students need at least three lines at the top left or right. We also need to start the page numbering on page two, not on page one. The first problem can be solved by using a very long line length (up to 250 columns) for your header or footer and letting your printer do the wrapping to place the one long header/footer line on three lines. A little experimenting may be necessary on your printer so just print your headers; then add or subtract spaces to get them right.

5. You usually want to start headers, footers, and page numbering on page two. The manual says to place the header command on line one, page one. This starts them on page one so don't do it that way. Place your header command somewhere in the first page after it is too late for it to start at the top of it. Place the footer command somewhere in the second page after it is too late for it to start at the bottom of the first page. When WW128 asks you what page to start numbering with, you still say "1."

6. Need to underline nothing—such as a line to sign on or to leave blank for someone to fill in? It looks all right on the screen but it won't print right on WW128—or will it? It will if you start and end the underlined spaces with something—anything. Start and end with an underlined period, a slash, a colon, etc. This triggers the underlining to start. Use the space bar to underline nothing. Then underline some character again to enclose it.

7. How 'bout entering printer codes in the "set printer" option under the "Print" menu? I usually write a document and print it in "draft mode" first. This gives me a chance to proofread it, check the margins, spacing, layout, etc. I then print out the final using the "set printer" option and one of the special modes like "near letter quality" or "proportional spacing." Proportional spacing, by the way, is often the best choice because, unlike NLQ, other special characters are available, and it is printed (on a Star SG-10) in "bold" (sorry, you can't "justify" and use proportional spacing). Warning! The use of proportional spacing affects the right margin, so check that before printing your final copy. When you choose "set printer," it gives you a opportunity to "Enter printer codes." Go ahead and enter the appropriate codes. You can get them from the "Word Writer Commands" if you are using an SG-10 or from the "set printer codes" list under the Print pull down menu if you have entered them correctly or from your printer manual—Example: 27,66,4 for NLQ. This sends a one-time message to your printer to print in NLQ. It will print in that mode (NLQ) until you tell it to print in some other mode—or until you turn it off and back on, thus setting it back to default (standard Pica). The rub is that after you enter the codes and press return, WW128 does not tell you whether or not you were successful. It just tells you to "enter printer codes" again. Ignore that, press ESC, and print your document.

One of these programs' great strengths is that Timeworks continues to improve them. For that reason, and if they

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WORD WRITER COMMANDS. V 3.2
Commands marked * good only on WW V3 and above
Compiled by Greg & Pat Tillery

FORMAT

Color, background.....CNTRL/B
Color, characters.....CNTRL/C
Convert ASCII (Convert pet ASCII to ASCII & return)—Load & Read "Update"
Format, Protect text from (tables etc) set line length 0 .....ie F8 10,0

EDIT

**Automatic Indent* .....(Cursor to point, then).....C= F7
**Automatic Indent off* (AT end of indented area).....C= F7
Center (Type line first then move to beginning of the line then) F5
Check Commands (must be in column 1) F8
**Current Function*.....F7
Cursor, movement .....Top cursor keys
Cursor, to beginning of present line.....CNTRL/left
Cursor, to end of present line .....CNTRL/right
Cursor, to top of display .....C=CLR/HOME
Cursor, to end of document .....Shift CLR/HOME
**Cursor,* to top of display.....C= CLR/HOME
Cursor, to top of document .....CLR/HOME
Cursor, to top of next page.....CNTRL/down
Cursor, to top of previous page.....CNTRL/up
**Cursor,* one word to right .....C= Right Arrow
**Cursor,* one word to left .....C= Left Arrow
Delete, left of cursor w/out pull left .....left arrow
Delete, over cursor with pull left .....DEL key
Delete, line (deletes cursor to end of line).....F3
Delete, word (deletes cursor to end of word).....F4

**Hard Return* (separate paragraphs, protected from format .....shift Return
Insert, line.....F1
Insert, toggle on/off .....INST key
Margins .....set left margin then set line length
Margins, Temp. (sets lm & line length) F8/1m,11
Marker, Printer start/stop (for spec printer codes).....F2
Menus.....ESC key
Page, forced .....F8 page
Page numbering (from print menu) .....Print menu or Headers/footers
Note: See Headers & Footers below for page numbering also.

Right align (Cursor at beginning of effected text then) F6
Spacing (double or triple etc.).....F8 S2 or S3
Note: If you use this you must select single spacing at print.
Tab, move .....TAB key
Tab, move backwards .....Shift/TAB key
Tab, Set.....Tab menu

Calculator

Calculator, call up.....C=F3
Calculator, add results to text-exit calc, cursor to where desired.....C=F5
Add.....+
Sign, change +to− or −to+.....:
Divide .....
Erase, clear everything C
Erase, clear most recent entry.....E
Memory, restore .....R
Memory, store .....M
Scientific notation (raise to power).....Up Arrow next to RESTORE
Subtract.....−

Headers

1. Move cursor to Line 1, page 1...F8 H:left margin:number of lines from top middle right
2. For page number set page <>
3. Example: F8H:10:3 Left middle Page<>

Note: To start Headers at the second page put the Header command somewhere within the first page. *Be careful to put line one at first line under write head! Spacing is important! Re-initialize Printer between printings!*

Footers

Same as headers except use F instead of H and page bottom is line 4 not 1.

Note: To start Footers (page numbers) on page 2 go to put footer command somewhere in the 2nd page. Start with page number 1 when asked by WW. *Be careful to put line one at first line under write head!* Spacing is important.

Note on Headers & Footers: To "Force" a three line header (or footer), push first section (to be the 1st line) *to end* on col 68. The 2nd section (to be the 2nd line) push *to end* on col 148. The last section (to be line 3) push *to end* on col 228. Start the header on line 1. This puts 3 line header at the top right corner. Make the line length for this first line 229 (put F8 10,60 on the next line). Make the page length 55 to make up for the wrapping of the header. Start Footer, if desired on line 3 *after* you start the correct margin & line length.

Spell Checker

View Words Down.....Up arrow
View Words Down, jump 10 words.....CNTRL Up arrow
View Words Up.....Down arrow
View Words Up, jump 10 words.....CNTRL Down arrow

On Screen Highlighting Toggle on/off

Underlining .....C= U
Boldface.....C= B
Italics .....C= I
Superscript (numbers only) (use 'C' commands for letters) .....C= +
Subscript (numbers only) (use 'C' commands for letters).....C= −
Note: You can combine any or all the above. Simply keep giving commands.

**On Screen Highlighting Turn off combined*.....C= Space Bar
**On Screen Highlighting Rewrite sections* Use 'Repeat function' .....C= R
Note: Must not be in "Insert mode" for Repeat function.

Printing

Page number.....select under print menu or imbed in header or footer
Chain Documents .....Under "Print Document" Reset Printer, Select 1st for .....1st page, Print it, Load next section then no reset .....Print, Load last section set "last" on reset.
DIP switches, printer SG10.....All on
DIP switches, interface MW-350.....S1 on, all others off
DIP switches, interface MW-350 For CP/M-S1 off, s2 & 3 on, all others off
DIP switches, interface G WIZ .....All off
Print, Stop.....ESC
Star Setup-(for these spec characters load wwcommands first)—Load "star" Under "Print Document select Yes to line feed, Secondary address 05, & Yes to Normal ASCII
Special character codes.....*Add to "Set Printer Codes"*
7) 27,66,4,27,66,5 Near Letter Quality
8) 27,112,1,,27,112,0 Prop. Spac
9) 27,66,2,,27,66,1 Elite
10) 27,66,3,,27,66,1 Condensed
(These options will be auto saved with document)
Special Character codes, use of.....In column 1 before section where they will be used put F8C and the number of the code as listed under "Set Printer codes" put block (F2) before & after characters to be made special or set printer to one only using "Set Printer" under Print menu. Printer" Then print.

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AMIGA

Amiga—The Structure Of Success

by Ervin Bobo

Though it's been only a bit over a year since the introduction of the Amiga computer to the retail marketplace, it seems much longer.

Due to relativity, a period of uneventful time will always seem short; a period of explosive events, such as we have had in the year of the Amiga, seems longer because our minds do not want to believe so many major events can happen in so brief a period.

"What major events?" he asked in a minor tone." The Amiga was introduced; it was a success from Day One; and the success continues. That's only one event."

True, but the structure of that success is in a continuing series of events. We know that legends must be renewed with each generation or they cease being legends. In the case of a legendary computer such as the Amiga, we might paraphrase that by saying that it must be redefined on a regular basis lest a single definition achieves such weight as to drag it into the mud of stasis.

(As an example, the Macintosh was brought to market bundled with MacWrite and MacPaint and for months no other software was available. It has since cost Apple a good deal of time and money to convince the business world of the many other applications possible).

For these reasons, the many major events of this first year are a chronology of changes in the identity of the Amiga as new applications were developed and marketed, redefining the computer on an almost regular basis.

In the beginning, it was a box that emitted color and sound and it had to be taken on faith: for once you'd ran the demo disks, there was no application for the Amiga other than what you might write in ABASIC. But your dealer had said, "Someday...."

Late in November, 1985, Deluxe Paint appeared and became a runaway best-seller, literally impossible for dealers to keep in stock, for it was the first application software designed specifically for the Amiga and it allowed users to do things they'd never before been able to do on a computer.

Certainly there had been MacPaint and the clones of it developed from other computers, but there is really no comparison for Deluxe Paint gave you thirty-two colors, color printing, rudimentary animation, screen swapping and a library of "brushes" (think of them as rubber stamps) that allowed anyone to become an instant artists. And it was the first program to employ the IFF format.

Properly called Interchange File Format, IFF was the establishment of a standard, a format for file saving that all developers could use in common.

Like a new theme in a symphony, dimly heard and then swelling to dominance, IFF would become a dominant factor in the way we stored and used graphic images, and because Deluxe Paint gave Amiga owners IFF as well as a handle on the untapped resources of the new computer, it became the first milestone.

The second came in December, with the official introduction of Textcraft. Unofficially, it had been around since Day One as a part of the dealer demo package, but it was slightly disabled. When it appeared in final form and could actually be purchased and used, it became the second major software event.

Yes, there have been word processors for as long as there have been computers. And there have been other word processors for the Amiga since the introduction of Textcraft. And while we are well aware that evaluations of word processors tend to be subjective and that a user's attachment to a particular piece can occasion a fist fight now and then, we'll still go out front and say that Textcraft has yet to be surpassed.

Though the user interface to Textcraft seems to borrow from MacWrite, it is not a copy of that program. Areas in which Textcraft excels are in the Help screens, the most extensive and easy to use and understand that I have seen on any word processor. Couple these with a default display that is easy to look at for hours at a time; pull-down menus; a dozen icons for formatting and moving text; the first application of the Amiga for productivity, and you have a major software event for the month of December.

In January, Amiga sales slowed. Those who cried doom for the Commodore-Amiga alliance neglected to mention that sales of all computers—and most other durable goods—slack off in the first month after Christmas.

There seemed meat to this particular rumor, however, for there were published reports in which the Numbers showed an operating loss for Commodore. Launching two major products in the same quarter (the other was the C-128) will strain the resources of most companies, simply because massive advertising efforts (dollars spent) must overcome customer inertia (dollars to be earned.)

In any event, the Amiga survived January only to be faced with February—and the day the bank loans made to Commodore would come due. In the short life of the Amiga, however, the unexpected was already becoming commonplace and once again the unexpected happened: As though to confound the doom criers who had portrayed them as wolves to the Commodore sheep, the bankers did not foreclose. Instead, they extended loan guarantees for a considerable length of time and it was said that this was done because of their belief in the future of the Amiga: they put their faith where it mattered most—on the table with the money.

As a rule, February, isn't much of a month. This year was an exception, for besides bringing a new lease on life, it also brought Skyfox. By the standards we've established, Skyfox should not be a milestone: it is a game first developed for other computers, notably the Commodore and the Apple.

Be that as it may, it was the first simulator (of sorts) for the Amiga, even though it won that position by default: SubLogic decided to put Radar Raiders on a back burner and thus Skyfox from Electronic Arts became the first Amiga flight simulator (although it was not designed to be such) and added fast action, blow-the-enemy-to-kingdom-come graphics and stereo sound.

In the future history of computers, there may never again be a February so fulfilling.

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The Amiga Workbench

by Ervin Bobo

Since the early days of computers, games having their roots in science fiction have dominated, from the artificial-world scenario of Life through all the imitations of Space Invaders, and with the advent of the Amiga computer the games have become more sophisticated—well, some of them have—and perhaps a bit more realistic.

This month we'll examine some of the current space games offered for the Amiga; a board game based on a futuristic tank; and a coloring book—all of them based on that affinity of computers for expressing the concepts of science and science fiction.

StarFleet One

Although I've never played it, one of the earliest space games for computers was a text adventure based on *Star Trek*. StarFleet is what I would imagine that game to be if it were dressed up with a few graphics routines.

Rather primitive by today's standards and especially so by the standards being set for the Amiga, StarFleet gives you what is intended to be a control console viewpoint of various missions in space. Although you may select the sector of space in which to fly and may change your speed and arm your weapons, etc., this is all done in text and with text replies from the ship's computer.

To be fair, your commands do not have to be typed. At the bottom of the screen are a series of "buttons" relating to Targeting, Navigation, Sensors, Weapons, etc. Clicking on a button with your mouse causes the equivalent text command to appear. In effect, you are working with a parser that understands mouse-clicks and so never have to worry about proper syntax.

While alien positions are indicated on a sector map by small moving icons, it is again as though you are deep in the bowels of a space ship, watching not the action but a radar screen showing moving blips in action.

Because of this viewpoint, I was never able to become really involved in the missions: it seems as though everything is happening "offstage" and to other people.

You are in control during the game, with responsibilities for setting course and speed of the ship; raising and lowering shields as needed; deciding when and what to fire as well as the energy level of the phasers used. All these things are important and you'll find that you must be not only a commander but a pilot, an engineer and a navigator as well.

Nor are the missions without purpose. You may be assigned to rid a sector of Krellan invaders, to guard a space station, to act as a pathfinder for the main fleet.

During play, the main part of the screen will echo any commands you have given such as firing a 172 energy-level phaser at the Krellan ship located at grid coordinate 7-4. On the grid itself, you'll see a blip travel toward the Krellan blip and then the text area on the main screen will inform you of the results of your action. In this respect, the game reminds one of the text adventures that support some graphics, wherein you are informed in text that you have struck with your sword and then informed as to whether the blow was parried or whether it dispatched the villain.

Yet there is that feeling of detachment, of not really being involved.

If it is meant to be a text adventure with graphics, StarFleet probably succeeds; but if it is an attempt at a graphics adventure it does not make the grade. Perhaps either the game or myself is suffering from an identity crisis.

There is extensive documentation, well illustrated with things I never saw in the game (spaceships and aliens and such), consisting of a Training Manual, an Officer's Manual and an Amiga supplement to

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Amiga vs Atari: Round 3
Will the "True" Atari Please Stand Up?

by Kenneth Jennings

I am a professional computer programmer and a long-time Atari 800 owner writing to comment on the article written by D. F. Scott which appeared in the January issue of *Computer Shopper*. That article is Scott's rebuttal to Sheldon Leemon's piece "The Myth of ST Superiority."

It is clear to me, if not to D. F. Scott, that Sheldon Leemon did an excellent job of presenting concrete, documented, proven facts for both computers, in a very well-written manner. It seems to me that Mr. Scott's problem is he can't accept that the facts say the Amiga is the most technologically advanced and superior 16-bit computer available today. He accuses Mr. Leemon of coloring the facts and of jumping on a few exaggerations made by the Tramiels. Perhaps it is too much to expect that the people who run Atari should remain objective about the facts. But they promulgate much thinking, and a critique of their reasoning does have a rightful place in the pages of an objective computer magazine (though there are fewer of those around nowadays).

I've performed numerous performance benchmarks to determine the number-crunching and graphics performance of both machines while deciding which to buy for my work and I've discovered a few pretty big exaggerations. "The ST is three times faster than the Amiga." Wrong. "The Amiga has no 640 x 400 display." Wrong. "None of the ST graphics modes steal time from the CPU." Wrong.

All wrong.

When both computers are reduced to calculating engines the ST is at best 11 percent faster than the standard Amiga in the 16 color, 320 x 200 and 4-color 640 x 200 modes, and many times the ST performed slower. In the 640 x 400 monochrome mode the ST consistently performed more than 15 percent slower because the video chip must refresh the screen 70 times per second versus 60 times per second for normal displays. The Amiga can display 4-color 640 x 400 graphics without stealing machine cycles from the 68000. A 14MHz, 68020-based Amiga with a 68881 floating-point coprocessor, while less than twice as fast as the ST, ran all the benchmarks consistently 25 to 50 times faster than the ST—a good indication that using clock rates to compare relative speed is foolish.

As for graphics operations, the standard Amiga performed everything I dished out 15 to 30 times faster than the ST regardless of the resolution. Mr. Scott errs when he maintains that graphics operations under windowing environments do not constitute drudgery to the microprocessor. If he understood more of what was involved in the windowing process, the following would become clear to him: Most 8-bit computers are, relatively speaking, very slow at drawing graphics, and all they have to worry about is whether or not a line is drawn outside the boundaries of the screen. Now consider the ST and Amiga, which are four to six times faster than most 8-bit machines. To draw a line the beginning and ending coordinates must be adjusted to the position of the window on the screen. Then the line must be clipped to fit in the window, and then it must be clipped if other windows overlap the output window. Now if you consider the amount of time it takes to perform 68000 instructions—a typical 68000 instruction can take 24 to 38 machine cycles to perform versus about six cycles for 6502 instructions—the throughput for graphics operations performed through software is going to be slow and simple text manipulations will be many times more burdensome.

It's really very ironic to me that so many Atari loyalists today claim the 68000 is some kind of super-duper number-crunching engine superior to custom hardware, when those same arguments were used by Apple users years ago to argue against Atari computers. "Why do you need player/missile graphics, all those colors, and that ANTIC chip? There's nothing the 6502 can't do." Today Atari users maintain that the 68000 is the next best thing to a mainframe when all it really amounts to is a glorified 6800 (or 6502). A multitude of benchmarks have been produced (among which is *BYTE* magazine's Bruce Webster's comparison of 68000 computers) which demonstrate the ST is slow all-around—in graphics, calculations, and disk drives. As an Atari specialist, Mr. Scott should know that no amount of software can compete with hardware performing the same functions.

That was the design philosophy behind the Atari 800.

Mr. Scott's reading of Mr. Leemon's article is also somewhat shaky. He claims Sheldon Leemon "concedes the ST is about 15 percent faster" in screen operations. This is just another myth, if I dare put it that way. Mr. Leemon was responding to Leonard Tramiel's statement that for serious CAD-CAM operations the ST is three times faster. Leemon's actual words were: "...the determining factor is clock speed, and as Leonard himself pointed out, the lead of the Atari is at best 15 percent." Note Leemon did not say that the ST is 15 percent faster at drawing graphics.

D. F. Scott says the ST will be even faster with the blitter chip added. Certainly the move to a dedicated graphics chip is a move in the right direction. But it is undeniably an afterthought in the case of the Atari ST. The ST's simple blitter is not as flexible as the Amiga's bimmer. The ST's blitter was originally going to cost $20 and make operations 200 times faster—the most recent numbers now say the blitter will cost $120 and make screen operations five times faster. So even with a blitter, it would seem, the Amiga will still be faster than the ST. What this all boils down to is that the Amiga is the fastest 68xxx-based machine available for all practical applications. Even if the ST is a few percentage points faster at some calculations, the Amiga can display the results of its work many times faster, therefore giving it

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Pagesetter Desktop Publishing For The Amiga

Reviewed by Ervin Bobo

There was a time when there were three archetypal programs for the computer: word processor; spreadsheet; database. If the published software for a computer included these three high-productivity packages, then it was a real computer. (The alternative to being a real computer seems to be in being a toy computer.) Real computers had a chance at success in the marketplace by virtue of being able to run these three programs (IF the spreadsheet was VisiCalc or Lotus 1, 2, 3, IF the word processor was WordStar, IF the database was dBase II or III) for it was well understood that if you had access to these three, then you had everything.

Almost.

It is probably ironic (certainly it is not an intended pun) that it was a Macintosh that upset the apple cart. Of course it was not the Mac alone, but the Mac in combination with a laser printer that added the fourth archtype: Desktop Publishing.

As archtypes go, desktop publishing was the last for seeable hurdle the Amiga had to overcome in order to become a complete computer—good databases finally having come out of the vaporware closet late in 1986. The surprise is that the program came not from an expected quarter but from a Canadian company called Gold Disk.

(In truth, I should not be surprised. One of the dead horses I sometimes beat has to do with the fact that, almost since Day One and with the single exception of Electronic Arts, the Amiga has been driven forward by small software companies that sometimes seem to have come out of nowhere.)

It's been a habit of mine to skip over most articles on desktop publishing and for a very good reason: I don't have a laser printer and the subject held no importance beyond that fact. Just in case you've been prey to the same mindset, I'm going to give you the punchline up front: Pagesetter, from Gold Disk, does NOT require a laser printer.

In fact, it doesn't even support them.

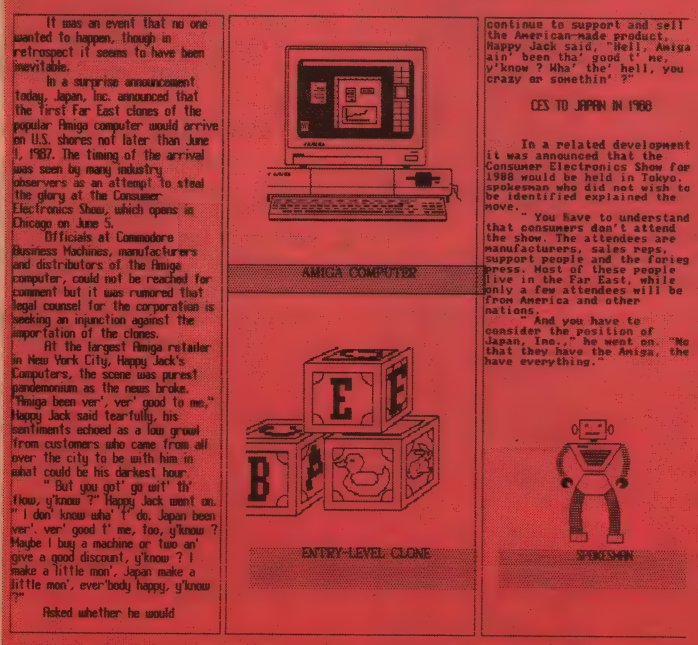
An Epson or Epson-compatible printer is recommended. We don't know what printer provided the illustrations in the documentation—they are ragged enough to scare you off the subject—but what we do know is that the Panasonic 1092 I use does a terrific job (see Figure 1) and the Okimate 20 (though mine exhibited a strange quirk) also does well. The Panasonic, of course, is Epson-compatible.

In beginning to use Pagesetter, you begin with a screen that looks a bit like the screen of Deluxe Paint: there are menus at the top and boxes full of tools ranging down the right side of the screen. Your screen is beige, however, and the tools are probably different from anything you've ever seen: QuickText, Mop, Link and Unlink, etc.

To begin, you must create a page. Selecting this from a pulldown menu presents you with a requester window in which you may specify the paper format; the size; all four margins and the number of columns. Once your selection is made a representation of that page will appear on the workscreen, complete with rulers at top and left.

Because it allows for mixing of fonts, sizes of type and graphics, Pagesetter works for a system of individual boxes. In the illustration given, I deliberately outlined all boxes so that you can get an idea of how this works.

Boxes are created by clicking on the box gadget and dragging


It was an event that no one wanted to happen, though in retrospect it seems to have been inevitable.
In a surprise announcement today, Japan, Inc. announced that the first Far East clones of the popular Amiga computer would arrive on U.S. shores not later than June 1, 1987. The timing of the arrival was seen by many industry observers as an attempt to steal the glory at the Consumer Electronics Show, which opens in Chicago on June 5.
Officials at Commodore Business Machines, manufacturers and distributors of the Amiga computer, could not be reached for comment but it was rumored that legal counsel for the corporation is seeking an injunction against the importation of the clones.
At the largest Amiga retailer in New York City, Happy Jack's Computers, the scene was purest pandemonium as the news broke. "Amiga been ver', ver' good to me," Happy Jack said tearfully, his sentiments echoed as a low growl from customers who came from all over the city to be with him in what could be his darkest hour.
" But you got' go wit' th' flow, y'know ?" Happy Jack went on. " I don' know wha' I' do. Japan been ver'. ver' good t' me, too, y'know ? Maybe I buy a machine or two an' give a good discount, y'know ? I make a little mon', Japan make a little mon', ever'body happy, y'know ?"
Asked whether he would
AMIGA COMPUTER
ENTRY-LEVEL CLONE
continue to support and sell the American-made product, Happy Jack said, "Hell, Amiga ain' been tha' good t' me, y'know ? Wha' the' hell, you crazy or somethin' ?"
CES TO JAPAN IN 1988
In a related development it was announced that the Consumer Electronics Show for 1988 would be held in Tokyo, spokesman who did not wish to be identified explained the move.
" You have to understand that consumers don't attend the show. The attendees are manufacturers, sales reps, support people and the foriey press. Most of these people live in the Far East, while only a few attendees will be from America and other nations.
" And you have to consider the position of Japan, Inc.," he went on. "Me that they have the Amiga, the have everything."
SPOKESMAN

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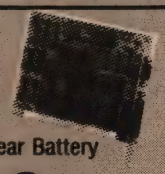

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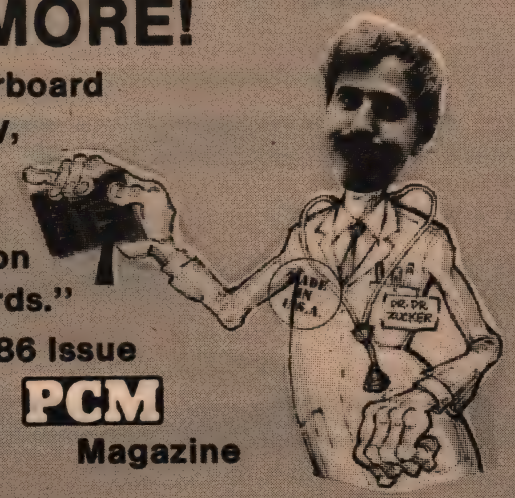

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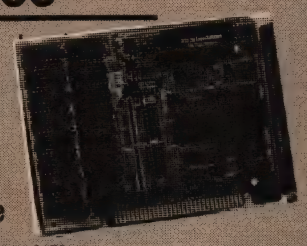

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TANDY COMPUTERS

Trackstar For The Tandy 1000

Reviewed by Lon Andrews

I have been involved with "which computer is best for the school" for some years now. One person likes Apple for its color graphics, another the Model III/4 for the network, while some preferred the IBM because it was the only "real computer." There were so many different reasons from so many different folks that it became like a game. My computer is...er (insert your favorite claim) than your computer! Since I came up through the TRS 80 Models I, III and 4, I didn't mess too much with the others. Apple has had the upper hand in the educational market for some time, especially in the elementary schools. There is a tremendous base of educational software available for the Apple family, more perhaps than any other single type of computer.

Personal preferences aside, the Apple has been the best all around classroom computer until lately. Apple jumped on the educational band wagon early and quickly developed the software that has kept them up front. That and the color graphics have sold a lot of Apple computer systems. Times are changing and the educational system has to keep up with the demands of the business world for graduates trained in "IBM compatible" systems and programming. I am fully aware that there are many businesses equipped with Apple systems but they are vastly outnumbered by the MS/PC-DOS equipped businesses.

Tandy has had the only workable network for educational use since the release of Network III. They have responded to the business world with their MSDOS machines and have quickly brought them into the price range of the educational system. What more could a teacher want than a lab full of the Tandy 1000 SXs networked together and controlled by the Tandy 3000. Tandy and ETS have really topped off the offerings with the new package for elementary schools (*Computer Shopper*, October 1986) and they are developing a similar package for high schools. Nothing on the market can touch this package for hardware or software.

Part of the problem arises from the amount of Apple hardware and software already in place. Few schools can justify the cost involved to completely change over and a slow change results in mixed software and hardware in the same lab—not a workable situation. It is like teaching with two different texts in the same class full of students, confusing to all. In order to eliminate the confusion the same computers are purchased, even if they are ten years out of date (if they are still available). People once trained on a computer are reluctant to change to another type, especially if that training was self taught. The same holds true for some types of software. Due to the complexity of the original software, once you are comfortable with it you hesitate to change over to a new, possibly better, program.

At this point the Trackstar board enters the scene. Imagine being able to run the Apple software on an MSDOS machine. The best of two worlds is available. We can put a Tandy 1000 SX in the classroom for less than $1,100 (color monitor and two drives). The Trackstar runs $395 with educational discounts available. For less than $1,500 we have two computers and the use of both MSDOS and Apple software.

According to the literature the Trackstar will allow you to run somewhere between 90% and 99% of the available Apple software on a MSDOS machine. The actual figure varies depending on the type of software being tested. If you are familiar with the Minnesota Educational Computing Corporation (MECC) Apple software you will appreciate the fact that over 90% of their software will run with the Trackstar. In a test series run by Dr. Chris Templar at Johnson Bible College the Trackstar tested 99.99% compatible on over 350 popular Apple programs. These included programs from M.E.C.C., Sunburst, Edu Ware, The Learning Company, Encyclopedia Britannica Corp., Grolier, Milton Bradley, AppleWorks, Bank Street Writer, Kid Writer and others. If you are into video games or some of the more exotic software you may have a problem. There are ways around these problems that aren't extreme or illegal.

The Trackstar is being offered only to educational systems by Tandy. It is offered on the retail market by its proud parent, Diamond Computer Systems, Inc., and they have reason to be proud. This

is one heck of a product for those that have use for it. It solves some problems for the family that has a PC at home, usually a clone, and the student that is using Apple at school. Now the student can bring home the work that before he had to complete at school. The possibilities for the schools are obvious.

Trackstar 128 provides Apple II, IIplus, IIc and IIe compatibility. The package pro-

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Family Roots: For Genealogy Lovers

Reviewed by Stephen B. Gray

The TV drama "Roots" started many people looking into their family trees, and eventually several computer programs were developed in response to this interest. Most of these programs are rather limited in scope.

Family Roots is an extensive, full-featured $185 genealogy database system, with a 150-page looseleaf manual, for anyone who has a great deal of family data, and who wants to set it up so it can be referenced in a variety of ways, printed out neatly, and be easily read and understood.

Family Roots has six main capabilities: data entry, charts, information sheets, lists of names, search, and histories.

In data entry, basic family information is stored for each member of the family. Information on the sources and date of entry can also be entered.

Three types of genealogy charts (also called pedigrees) and a chart of both predecessors and descendants can be printed. You decide how many generations to show, and what information is to be included for each person.

Information can be printed out for any one person, or by family groupings. Again, you decide on format and on what information to include. You can search the database in edit mode for whatever interests you. The database allows you to store text data, such as histories, anecdotes and notes, which can be retrieved by the name of the person concerned.

Family Roots runs on a TRS-80 Model 4 running under TRSDOS 6.0 or later. It is also available for the Apple II+, IIe, or IIc; IBM PC and PC/XT; Kaypro, Epson, etc.; and Commodore 64. All versions are written in BASIC, and require at least one disk drive. Up to six disk drives, a printer, hard disk and clock are supported.

A demo disk with a tutorial manual, at $9.50, is available if you'd like to check out the program before buying it, from Quinsept, Inc., Box 216, Lexington, MA 02173; (617) 641-2930.

Updates of the software are made three or four times a year. A newsletter is published by a user group which is not run by the company.

EDIT is the data-entry program, with which you set up a record for each name you want to keep data on. Each record can be used to store up to nine user-defined fields, such as date and place of birth, date and place of death, place living, mother, father, children, etc. For each marriage, the spouse, date and place of marriage, and marital status can be entered. Each name is associated with a record by number; thus records can be accessed by either name or ID number.

When you are finished with your entries for one person, the program may copy some of the data to other records. For example, if you enter marriage data for one person, EDIT also puts that data into the spouse's record, to save you the trouble of entering it twice.

CHARTS prints four different types of genealogy charts. A free-form chart lets you include only names, or names plus any other data you want to add for each person on the chart. This type of chart is available for both predecessors and descendants. The standard pedigree chart includes four generations. A special pedigree

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Trackstar
continued from page 131

vides an Apple Game Port, supports serial and parallel ports, 40/80 column, 128K Memory and 65C02 Microprocessor. Requirements to run the Trackstar are simple, 128K memory, a color or composite monitor (640x200) or a TTL monochrome monitor (720x350 selective) and at least one 360K floppy disk drive. As you will see later you might also want an Apple disk drive. From what I can see the board will function in almost any IBM compatible. The only Tandy 1000 model that I haven't found listed here is the EX.

Opening the package I found an exceptionally well constructed board. You can't confuse the connectors or chips as they are labeled so that even I can read them. Along with the main board is the disk adaptor board and cable, an RGB video cable, a composite video cable, a couple of capacitors and two diskettes. The Trackstar diskettes are copy protected so Diamond has provided two of them for the user. This copy protection is one of the few things that I didn't like about this package. (NOTE: A phone call to Diamond to verify price of the Trackstar, after this was written, produced the reason for the protection. Both Apple and IBM files are on the disk and many have been destroyed in the process of trying to copy them. Diamond placed the protection on the disk to prevent this from happening. Replacement disks are available at 2 for $7.00. SYSCOPY, which is used to place the DOS files on the Trackstar disk, will also effect minor disk repairs in the event that you erase or blow a file.) No system files are on the disks and must be placed there, in order to allow you to boot, by using a program provided on the disks.

Installation

Installation of the Trackstar is pretty straightforward. Read the manual **first** before starting the installation of the board. The manual with my board contained a few errors that Diamond has corrected with an addendum sheet. Using this sheet, go through the manual and write in the corrections to eliminate any confusion. Study the drawings for part identification and location. Be aware of the number one pin locations on the connectors. Select the slot for the board. The only thing I found with choice of slots is that you will need two if an external Apple Unidisk Drive is to be used. The extra is for the additional bracket (optional) required for the Apple connector. Insert the board in the slot you have selected. Leave the screw out of the bracket until the video installation is completed.

Disconnect the floppy drive cable from the motherboard. Connect the Trackstar disk interface card to the motherboard where the original disk drive cable was connected. Again be sure of the number one pin alignment. Connect the other end of the cable to the Trackstar connector (J6). Pin 1 of J6 is missing and the corresponding pin on the cable is blocked. The original drive cable connects to the other side of the Trackstar disk interface card.

If the installation will include an Apple disk drive in the case connect the drive cable to the board at J4. If the drive is to be external install the optional bracket and cable so the drive can be connected to the external 19 pin connector on the bracket.

The video cable feeds through the bottom of the slot that houses the Trackstar board. The bracket is notched

continued on page 282

Family Roots
continued from page 131

form compresses six generations into one page.

GROUPS and PERSONS print or display data organized by individual or by family group. The family group sheet in GROUPS uses the Mormon format, which includes husband, wife, important dates and places for each, other marriages, children from this marriage, spouses of the children, and sources.

LISTS constructs indexes of your names in many ways. Any list may be printed or displayed in either alphabetic or numerical order. You may select people to include in your list by diskette, by number range, by last name, or by such criteria as everybody with the same first name.

SEARCH is the most interesting program, because it lets you look through the database for information of your choice, such as all people whose records mention Omaha, or everyone who was a teacher. You can look for people with the same birthday, or everyone living in a certain year.

TEXT lets you store as much as you want for notes, descriptions, or even a small report or book. Access is by name or number.

Utility programs let you format empty data files on blank diskettes, print blank pedigree charts, set up information in a master control file to be used by all the programs, renumber the ID numbers for selected people, make an address list of living relatives, read out the identity and contents of a Family Roots diskette, and put a list of names (previously saved on diskette) back into the computer's memory.

Family Roots contains many small but useful features. For instance, if you use Auto Date, every time you change any piece of information for a person, the date will be changed to show when you did it.

To get started, you boot up the Main Programs floppy, which soon presents the first menu:

(A) EDIT	(Data Entry)
(B) GROUP	(Group Sheets)
(C) PERSONS	(Individual Sheets)
(D) SEARCH	(Examine Family Data)
(E) PROGRAMS	(Insert Other Diskette)

Because you need to format some data diskettes, you insert the Auxiliary Programs floppy, hit the E key, and get a second menu of 12 choices, including

(H) CREATE	(Make Empty Diskettes)

So you put a blank diskette in drive 1, hit the H key, and get an error message. That's because you didn't read enough of the manual, which says that, in addition to formatting the blank floppy, "You MUST have run CONFIGUR and followed the procedures described in section 3.3 before you run CREATE."

So you run CONFIGUR, which is quite extensive, to create a file on what hardware you're using. You do this just once, when you first set up your system, by setting the hardware configuration and the record parameters (user fields); default values are provided for the novice. CONFIGUR then writes this data onto the program diskettes (NOT the data diskettes), and you're ready to use EDIT.

Once in EDIT, the first thing you do is press the 2 key, which brings up the EDIT NAMES menu, to let you add a name, change a name, or save your names on disk. Each time you select one of the name-editing options, you sequence through a few questions and a "fill in the blanks" type of operation, and then return to the EDIT NAMES menu for your next selection. For example, if you choose to add a name, you supply one complete name and return the menu; this lets you correct the name, or erase it right away if you made a mistake.

When you add a name, an ID number is linked with it, to be used extensively by all the Family Roots programs. You can choose each ID number yourself, or let the computer do it by starting at some number of your choice, and continuing sequentially.

The EDIT program (and all the others) see names as having four parts: last name at birth; first name(s); married last name; and title. You enter each part separately, so each can be accessed separately. Title is intended for "JR," "DR,"or "II," but because can be used for anything you want, or left blank.

Once you've entered all the names, you're ready to add the rest of the information for each person. So you hit the 1 key for editing records, and you'll be asked if you want to edit records by number range, by number list, or by name. Each record includes data on when and where the person was born, parent's names, number of children, number of notes, etc. The manual is highly detailed at this point, with all sorts of helpful information.

After you've saved the database information, you can get into CHARTS, to print out the data. You've got a choice between free form, standard, and compressed charts. Each generation is indented on the printout, with a column header that identifies each grouping as being person, children, grandchildren, etc. You read the chart by following dotted lines down the sheets; for example, all great-grandchildren's names appear immediately after the dotted line that begins from the GREAT GRAND CHILDREN header. The Figure A shows part of a sample chart from the manual.

Pedigree charts work in the other direction, showing first the person for whom the pedigree is being printed, then his parents, grandparents, etc., in tabular form. Compressed charts squeeze as much as possible into as little space as possible, by printing all the information about one person on one line.

Individual records can be printed from the PERSONS menu.

Family Roots is not for everybody, but it can be of immense help to anybody who wants to keep track of an extensive family in a sophisticated manner, and who is willing to devote time and patience to it. The manual is one of the most extensive and helpful I've ever seen, written in very simple language it's especially useful to the beginner with a limited or zero knowledge of genealogy or computers. ●

```
        Descendants Of Josiah     BICE (ID=19)     19 Jan 1984

                                  GREAT
                        GRAND     GRAND
PERSON     CHILDREN     CHILDREN  CHILDREN
!          !            !         !
!JOSHIA BICE (ID=19)
!          !
!          !ALONZO W. BICE (ID=175)
!          !    MOTHER: HARRIET COCHRAN (ID=18)
!          !         !
!          !         !HARRIET BICE (ID=482)
!          !         !    MOTHER: MARY DAVIDSON (ID=78)
!          !         !
!          !         !EMEL BICE (DIED AT 2) (NO ID)
!          !         !
!          !         !WALTEN BICE (ID=417)
!          !         !    MOTHER: MARY DAVIDSON (ID=78)
!          !
!          !MARY LUCINDA BICE (ID=176)
!          !    MOTHER: HARRIET COCHRAN (ID=18)
!          !         !
!          !         !HARRIET LAVINA MAPES (ID=419)
!          !         !    FATHER: JACOB MAPES (ID=65)
!          !         !
!          !         !FLORENCE A. MAPES (ID=48)
!          !              FATHER: JACOB MAPES (ID=65)
!          !         !
!          !         !ANTHEN D. HOSTETLER (ID=48)
!          !         !    FATHER: HENRY ADAM HOSTETLER (ID=66)
!          !         !
!          !         !ROLLEY R. HOSTETLER (1883-6) (NO ID)
!          !         !
!          !         !ELMER B. HOSTETLER (ID=429)
!          !         !    FATHER: HENRY ADAM HOSTETLER (ID=66)
!          !         !
!          !         !ROY W.D. HOSTETLER (ID=49)
!          !         !    FATHER: HENRY ADAM HOSTETLER (ID=66)
!          !
!          !WILLIAM HENRY BICE (ID=16)
!          !    MOTHER: HARRIET COCHRAN (ID=18)
!          !         !
!          !         !LAURA BICE (ID=17)
!          !              MOTHER: ELIZABETH FEAST (ID=15)
!          !         !         !
!          !         !         !ESTHER JOSEPHINE MAYER (ID=20)
!          !         !         !    FATHER: ERNEST JACOB MAYER (ID=13)
!          !         !
!          !         !MARY E. (MOLLY) BICE THOMPSON (ID=135)
!          !         !    MOTHER: ELIZABETH YEAST (ID=15)
```

Figure A

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SANYO

Fixing The 768K Miller Memory Modification

by Andy Dessoff

If, like me, you were intrigued by the possibility of making your Sanyo 550/555 computer memory-wise the equal (or better) of any ordinary IBM PC, you may have jumped on the opportunity presented by this publication almost a year ago when *Computer Shopper* showed us all how to upgrade our Sanyo Computer to 768K of memory on the motherboard (see "750K the Safe Way" by Francis D. Miller, *Computer Shopper* May 1986). Using memory chips and ICs offered at low prices in *Computer Shopper*, plus some parts from the local Radio Shack, this article allowed me to upgrade my computer's memory "to the max" for about $75. On the whole I was very satisfied with the modification, yet some strange phenomena made me wonder if all was well with my computer after this somewhat radical operation.

What strange phenomena am I talking about? Well, two kinds. Running the Sanyo's memory test program (MTEST) would indicate memory errors in every byte of the red and blue screen memories. And my monochrome monitor would occasionally show random pixels on that had no reason to be on, or in other cases within text displayed on the screen some pixels would be on at high intensity within text that was displayed at low intensity, leading to a screen that looked "untidy" and was often hard to read. I don't have a color monitor connected, but because of the errors in the red and blue screen memory I would assume that a color monitor would have shown random red and blue pixels on where they were not supposed to be.

As I am more of a programmer than a hardware hacker I tried at first to get a resolution to this problem from some hardware experts, but to no avail, so I had to solve the problem myself.

It turns out the problem is caused by the modification made to U65, a 74LS02 quad NOR gate which controls the Output Enable of octal latch U55, a 74LS373. The modification had tied pins 8 and 9 of U65 to ground (see Figure 1b). Before the modification, these two inputs were connected to the two high-order address bits (A19 and A18) as per Figure 1a. Tying these pins to ground enabled the use of memory above the 256K boundary, but it also eliminated the distinction between a memory access to main RAM and a memory access to the red or blue screen memories which are located at addresses 0F0000H and 0F-4000H.

One of the possible solutions to the problem is to reintroduce that distinction, but in such a way that addresses within the 768K are considered RAM, while the red and blue screen addresses are not. In short, we need to reconnect address lines A19 and A18 but replace the NOR gate at pins 8-10 of U65 with a NAND gate (see Figure 1c). Compared to making the original modification this will be a minor procedure. And as you were audacious enough to build the modification in the first place, I will assume that you know all there is to know about dismantling your Sanyo, voiding the warranty (hah!), the dangers of handling ICs, soldering and desoldering on circuit boards, numbering of IC pins, etc. Instead I will tell you that you will need the following parts from your local Radio Shack or mailorder source:

1)1 - 14 pin Dip Header
2)1 - 14 pin Soldertail IC socket
3)1 - 7400 or 74LS00 Quad NAND gate
4)1 - 74LS02 Quad NOR gate

First you must remove the old U65 that had pins 8 and 9 cut and tied to ground as part of the modification. If you installed a socket for U65 when making the earlier modification (as I did), your work now will be less, and you will not need item 2 above. Otherwise I would advise you to install that socket now before doing anything else. You may have noticed that there are IC sockets on the market whose dimensions are such that they do not fit into the narrow spacing of the Sanyo motherboard. I ended up using Radio Shack sockets. These are not the least expensive ones available, but they are small enough to fit the Sanyo. As for item 3) above, I would have normally used a 74LS00 as the LS versions of the ICs are faster and use less power, but when I built mine I only had an ordinary 7400 available and it turned out to work just fine.

From one LS02, one LS00 and one dip header we will now proceed to build a part that is not ordinarily available in the electronics market: a 3-NOR-1-NAND gate device that can be plugged into the socket which you installed for U65. This project is complicated just slightly by the sad fact that the LS00 and LS02 mostly do not have the same configuration for the input and output pins of the gates. Cut away all pins of the LS00 except pins 7-10 and 14. Cut away pins 8-10 of the LS02. Push the LS00 on top of the LS02 in a piggyback arrangement making sure that the remaining pins are aligned nicely, then solder together only 7 and 14. On the top LS00, bend away from the lower IC the remaining pins 8-10. Now solder three thin wires of about 1/2-1" length to pins 8-10 of the dip socket (wirewrap wire will do nicely.) Align the piggybacked LS00 and LS02 on top of the dip header and solder all remaining LS02 pins to the corresponding pins of the header. Then connect the remaining pins 8-10 of the header to the

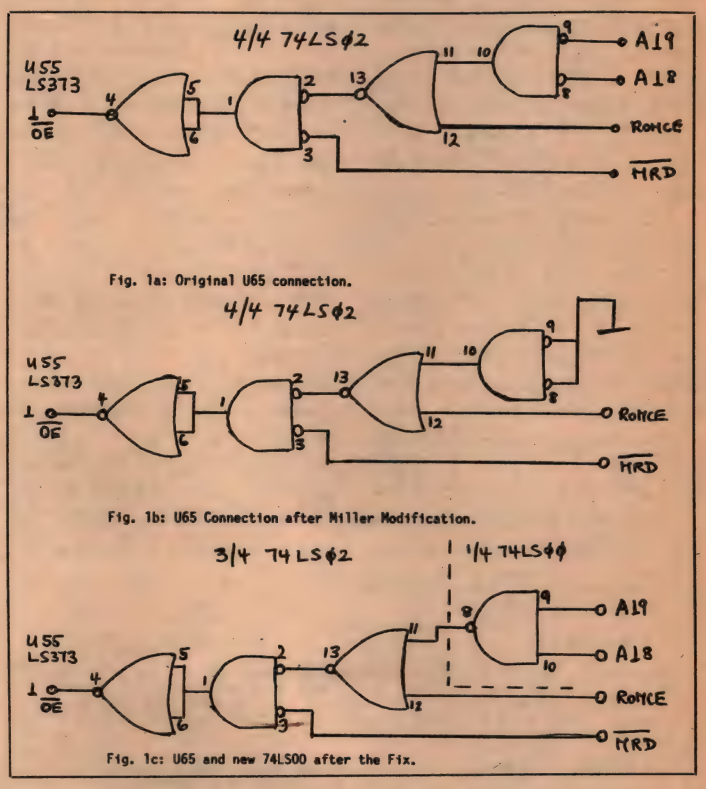

Fig. 1a: Original U65 connection.

Fig. 1b: U65 Connection after Miller Modification.

Fig. 1c: U65 and new 74LS00 after the Fix.

LS00 on top of the piggyback using the wires you soldered onto the header before. Connect header pin 8 to IC pin 10, header pin 9 to IC pin 9, and header pin 10 to IC pin 8. This completes the 3-NOR-1-NAND gate device.

Plug the completed piggyback device by its header into the U65 socket. Make sure that pins 8-10 of the LS00 on top do not touch anything else. Put your computer back together, boot it up, and the garbage will be gone from your screen. Now you can really enjoy your 768K the Safe Way. ●

The Silver Box

by Richard Fujita

More About Serial Interfacing

In MSDOS machines, including the Sanyo-555, very few people use the serial interface provided by the MSDOS. The worst part is the serial input function of the interrupt 3. When you invoke this DOS function call by generating interrupt 3, the CPU is forced to wait for a character input to the serial port, which may or may not happen. If your modem was not actively receiving a string of characters and if you invoked this call, your MSDOS computer (which is your Sanyo) just hangs and stays put.

Unless you have set up a NMI (Non Maskable Interrupt) switch and a routine to handle it, (just like I have described, such a scheme using the SYMDEB in last month's column,) you have to reset the computer, or, find ways to generate an RS-232C input to cause the CPU to return from the routine. There is no DOS call to check the arrival of a character at the serial port. This is a serious lack of a vital function. Without it, there is no way to accomplish an effective interface between the computer and the outside world.

The BIOS call, interrupt 14, on the other hand does provide better interfacing tools, except that the interrupt driver may steal or drop a character, or two, from your communication when you were not expecting this to happen. The evil stems from the fact that the USART (Universal Synchronous Asynchronous Receiver Transmitter) 8251A generates two separate signals for interfacing, the TXRDY and RXRDY signals, but in the Sanyo these two signals are combined by a NOR gate.

If the TXRDY signal is high as it usually is, the RXRDY signal is masked by it and no input interrupt is produced at the time a character reaches the serial port, unless the 8251A is programmed for receive-only and the TXRDY signal becomes permanently inactive. No interrupt signal means no interface is made in an interrupt-driven routine like this. The character arriving at the port will remain there and all the incoming characters after the very first one will be lost until your user routine reads it.

The DOS and BIOS usually just ignore the serial port. This is the normal state, but, when you send character(s) to the transmit port, the TXRDY signal goes low and the heretofore masked RXRDY signal activates the interrupt. Then, the BIOS picks up the character and moves it to the input buffer located at 0040:21B1H for IO.SYS VERSION 1.00, at 0040:1B41H for the [VB] IO.SYS VERSION 1.02, at 0040:1B51H for [VB] IO.SYS VERSION 1.03. (The interrupt 14 reads this buffer

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The Silver Box
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one character at a time if the buffer contains any received characters.)

I wrote a simple assembly language routine to pick up the contents of the buffer, move them to the top of the red screen in the original Sanyo screen, which appear as a string of red smudge, then print them on the screen through DOS. This program I named MOVEAUX.ASM is shown in the LIST 1.

What this program does is as follows. It first checks the 1st and 2nd bytes of the buffer. The first one is the Writing Pointer and the second byte is the Reading Pointer. Every time when a character is read by the input routine, the character is written into the cell pointed to by the Writing Pointer and the pointer is incremented. Every time the buffer is read, the character pointed by the Read Pointer is read into AL register and the pointer is incremented and updated.

In short, the difference between the Write Pointer and the Read Pointer is the character count stored in the buffer.

The revolving buffer is 256 characters long in which the head is adjacent to the tail end of the buffer. One caution; the buffer will never run out of space but the contents could be overwritten by arriving data if not read in time. The BIOS may stop receiving if the unread characters are more than 224 bytes, by pulling both DTR and RTS signals inactive. This is done by sending command "05" to the 8251A USART.

This auxiliary port buffer resides in the BIOS starting at 040:1B51H in Version 1.03 of the Sanyo IO.SYS. The exact location differs by the version of the IO.SYS you have. You should enter the location as the value of the BUFOFS in the MOVEAUX.ASM. As shown, the LIST 1 has the value for the Version 1.03 IO.SYS. If you are not sure which IO.SYS you have, use CHATT.BAT and CHATT.ASC of LIST 2 to check the version.

The CHATT.BAT searches for the location of the ID in the IO.SYS using DEBUG.COM and then locates the address of the AUXILIARY PORT BUFFER. The latter indicated value is the real location minus 1. You should add 1 to the indicated offset value to arrive at the real offset. Following is the table of ID locations where you can find the IO.SYS identification characters for the different versions of the Sanyo IO.SYS, given by the CHATT.BAT. (MSDOS 2.11 only).

XXXX:08BC – IO.SYS VERSION 1.00
XXXX:2765 – [VB] IO.SYS VERSION 1.02
XXXX:2775 – [VB] IO.SYS VERSION 1.03
XXXX:67BF – [VB512] IO.SYS VERSION 2.02

If the address you get is none of the above, you have some IO.SYS which I do not have access to. In this case you must type -[S 040:1000 2800 27 00 00] while you are in DEBUG. This search will find the location of the buffer minus one. If the DEBUG returns without finding any location, you should extend the coverage of the search. The bytes "27 00 00" are the combination of the bytes you find at the head of the buffer. Add one to the address you get and enter the value in the program as BUFOFS EQU VVVV. "VVVV" means the value. Then assemble the program using the IBM or Microsoft Macro Assembler and Linker into EXE or COM file whichever you like.

This program and the LINKOM.PAS program appeared in the last Silver Box article including the EXE or COM executable files with addition of some other programs that appeared in my past articles. These will be made available for the subscribers of the *Computer Shopper* magazine. Interested parties should write to me care of *Computer Shopper*.

Usually the interrupt driven BIOS receive routine for the RS-232C port remains inactive, except for a few milliseconds each time you send a character. If the BIOS serial input routine was activated in a manner described above while you are using a user written serial interface, the BIOS may succeed in stealing a character or two and put them in its buffer. In order to avoid this from happening, a good program puts a new mask in the interrupt controller and masks out the interrupt from the USART.

The BIOS uses considerable amount of program codes yet what it can accomplish is less than satisfactory because the interrupt generation is under influence by other DOS functions. If you want to avoid this difficulty, you must manipulate the interrupt controller as some programs do. One such program is the QMODEM. If you do control the interrupt controller, you are on your own path and you have to have your own serial port routine.

The XMODEM.ASM

One simple and possibly good program to do the interface job is XMODEM but some versions have a number of bugs and short comings, some outrageous, some not so obvious. This is a famous public domain communication program used by many (at least in the CP/M world) to down load public domain software from public BBS. The copy I obtained could not be assembled by MASM Version 4.0 without corrections. Besides, it had several other flaws which had put some strong doubts in my mind whether this program ever ran in an MSDOS machine. The problems included improper setting of the DS register and the lack of end markers for the character strings, except for a few.

Somebody may have intentionally done so, since the pattern is inconsistent. Some messages have the end marks but most have not. Also, the 1555th line "MOV BX,OFFSET OPTBL" produced error of "Operator Required." The operator is supposed to be a 16 bit Word but it was "typed" as a BYTE since the value happened to be less than 255. This was the cause of the error. This situation can be remedied by declaring the value as DW (a Data Word) or by removing the declaration as an OFFSET.

The first correction can be done by simply inserting a line "OPTABLE DW OPTBL" and use the name "OPTABLE" in the line 1555 instead of "OPTBL." Both of these methods worked, and the MASM assembled the ASM file into OBJ file. The second method of correction can be implemented as follows. An OFFSET requires a 16 bit Data. If the value was stored as 8 bit data, which was this case, the MASM sees a type mismatch error and declares it in a somewhat misleading expression. This problem can be rectified by removing "OFFSET" from the line 1555.

The one other problem I

continued on page 298

LIST 1. MOVEAUX.ASM

```
TITLE MOVE103.ASM
;
; THIS SMALL PROGRAM EXTRACTS WHATEVER YOU HAVE IN THE AUX PORT
; BUFFER AND PUTS THE CONTENTS IN THE RED VRAM SANYO SCREEN WHICH
; YOU MAY OR MAY NOT USING.  THE PROGRAM THEN PRINTS THEM ON THE
; SCREEN.  THE MOVED CONTENTS REMAINS IN THE RED VRAM UNTIL THEY
; ARE OVER WRITTEN.
;
; THE PROGRAM IS FOR SANYO IO.SYS VERSION 1.03.  USE 21B1H FOR
; VERSION 1.00, 1B41H FOR VERSION 1.02, AS VALUE OF BUFOFS.  IF
; YOU ARE NOT SURE WHICH VERSION OF SANYO IO.SYS YOU ARE  USING,
; USE THE CHATT.BAT IN 'LIST 2' TO IDENTIFY IT.
;
BUFSEG  EQU     0040H
BUFOFS  EQU     1B51H           ;LOCATION OF AUX BUFFER
DSTSEG  EQU     0F000H          ;USE RED VRAM AREA
;
CODE SEGMENT PUBLIC 'CODE'
;
    ASSUME    CS:CODE
;
MOVE PROC FAR
        PUSH    BP
        PUSH    DS
        PUSH    ES
        MOV     BP,SP
        XOR     CX,CX
        MOV     AL,13H                  ;CONTROL 'S'/DC3
        OUT     28H,AL                  ;STOP SEND
;
;FOLLOWING IS THE USART DISABLE ROUTINE.  WE DON'T NEED THE USART
;UNTIL WE FINISH OUR JOB.
;
        MOV     AL,00H                  ;STOP THE USART
        OUT     2AH,AL
        CLD
        MOV     AX,BUFSEG               ;THE BIOS SEGMENT
        MOV     DS,AX                   ;IN DS REGISTER
        MOV     AX,DSTSEG               ;DESTINATION SEGMENT
        MOV     ES,AX                   ;IN ES REGISTER
        XOR     DI,DI                   ;CLEAR THE DI
        MOV     SI,BUFOFS               ;AUX BUF ADDRESS IN SI
        PUSH    CX                      ;SAVE IT IN CASE
        XOR     CX,CX                   ;CLEAR CX
; NOW  WE  NEED THE TWO CHARACTER POINTERS TO SEE  HOW  MANY  WE
; SHOULD READ
        MOV     AX,DS:WORD PTR[SI]      ;GET THE CHARACTER POINTERS
        PUSH    AX                      ;WR PTR IN AL, RD PTR IN AH
        SUB     AL,AH                   ;GET THE CHARACTER COUNT
        OR      AL,AL                   ;CHECK IF NOT ZERO
        PUSH    SI                      ;SAVED AX AND SI FOR LATER
        JZ      FINISH                  ;GETOUT IF ZERO COUNT
        MOV     CL,AL                   ;SET VALUE TO COUNTER
        INC     SI                      ;MOVE TO RD PTR
        MOV     AL,DS:BYTE PTR[SI]      ;GET THE POINTER
        XOR     AH,AH                   ;CLEAR AH
        INC     SI                      ;MOVE TO THE FIRST CHARACTER
        ADD     SI,AX                   ;CHARACTER LOCATION TO READ
REP     MOVSB                           ;MOVE THE STRING
        MOV     ES:BYTE PTR[DI],0DH     ;ADD CR
        INC     DI
        MOV     ES:BYTE PTR[DI],0AH     ;ADD LF
        INC     DI
        MOV     ES:BYTE PTR[DI],24H     ;PUT THE TERMINATOR '$'
FINISH:
        POP     SI                      ;POP PUSHED REGISTERS
        POP     AX
        POP     CX
        MOV     AH,AL                   ;RD PTR = WR PTR
        MOV     DS:WORD PTR[SI],AX      ;RESET BUFFER TO ZERO COUNT
        PUSH    ES                      ;PREPARATION FOR PRINT
        POP     DS                      ;ALIGN DS WITH THE DSTSEG
        XOR     DX,DX                   ;POINT TO THE ZERO OFFSET
        MOV     AX,0900H                ;LOAD PRINT FUNCTION
        INT     21H                     ;DOS CALL
        MOV     AL,37H                  ;REACTIVATING THE USART
        OUT     2AH,AL                  ;TO SEND AND RECEIVE.
        MOV     AL,13H
        OUT     28H,AL                  ;CONTROL-S IS SENT
        MOV     SP,BP                   ;RESTORE SP
        POP     ES                      ;POP REGISTERS
        POP     DS                      ;RESTORE ORIGINAL DS
        POP     BP
        PUSH    DS                      ;PUSH ORIGINAL DS
        XOR     AX,AX                   ;AND OFFSET 0000 FOR RETURN
        PUSH    AX                      ;PUT IT IN STACK
        RET     FAR                     ;EXECUTE THE FAKE JUMP
MOVE    ENDP
CODE    ENDS
        END     MOVE                    ;SET THE ENTRY POINT
```

LIST 2. CHATT.BAT

```
YOU MUST ENTER THIS LIST, THE LINES IN
BETWEEN THE SQUARE BRACKETS ONLY, AS AN ASCII
FILE.  DO NOT TYPE BRACKETS.

YOU CAN USE YOUR OWN EDITOR.  SOME WORD
PROCESSORS CANNOT PRODUCE PURE ASCII FILE AS
REQUIRED.  YOU CAN ALSO ENTER THIS USING THE
DOS COPY FUNCTION.  TYPE

A>[ COPY CON CHATT.BAT ]

AND FINISH OFF WITH CONT-Z AND CR.

[
REM     ===== CHATT.BAT =====
A:DEBUG < CHATT.ASC
REM     ===== ADDRESS/VERSION TABLE =====
REM     XXXX:08BC       VERSION 1.00
REM     XXXX:2765       VERSION 1.02
REM     XXXX:2775       VERSION 1.03
REM     XXXX:67BF       VERSION 2.02
]


IN ORDER TO USE THIS, MAKE A NEW 'SYSTEM'
DISK, COPY DEBUG.COM, THIS FILE, CHATT.BAT,
AND THE CHATT.ASC SHOWN IN THE LIST 3.  PLACE
THE DISK IN THE 'A' DRIVE AND TYPE [ CHATT ].
```

LIST 3. CHATT.ASC

```
THIS IS A COMPANION PROGRAM TO THE CHATT.BAT.
YOU NEED THIS TO RUN IT.

[
L100 0 5 1
E10B
20
W100 0 5 1
N A:IO.SYS
L
S 800 2800 49 4F
RDS
0040
SEARCH FOR AUX BUFFER
S 1B00 2300 27 00 00
Q
]
```

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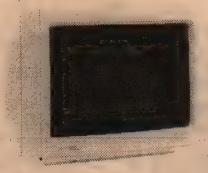

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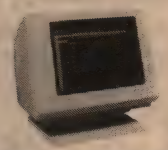

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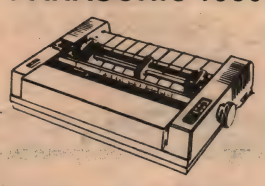

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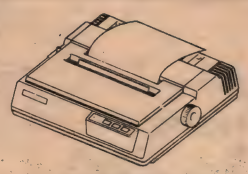

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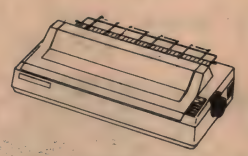

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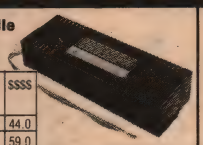

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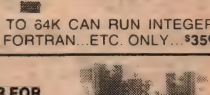

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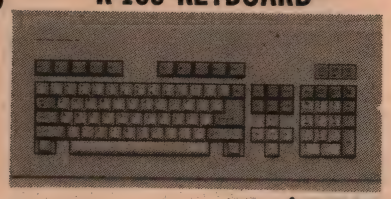

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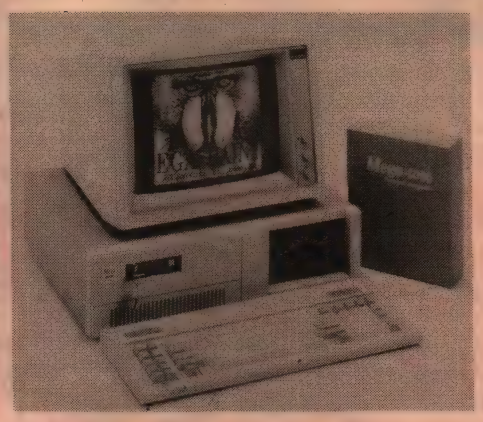

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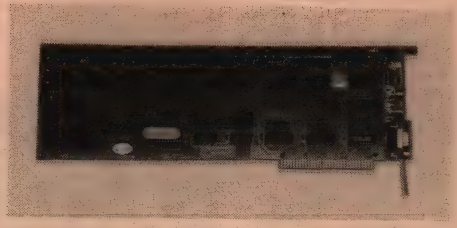

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TIMEX/SINCLAIR

Sinclair Survival Column

by Mark L. Fendrick

This month we start off with a story. On a recent trip to a local software emporium, I had a conversation with the owner. As often happens, he had—hidden in his closet—a T/S 1000 which he purchased, used for a while and then moved on. During that time he had upgraded it with extra memory, external keyboard and an on/off switch. He was on the road (in Pittsburgh as it happened) and spotted the computer in a local store, and to pass some time bought and assembled the kit and was fascinated by what this little wonder could do. Soon applications were developed using the built-in Sinclair BASIC—one stroke keywords and automatic syntax checking—and the T/S 1000 was serving a useful purpose.

In time, as many T/S 1000 and ZX-81 owners did, he outgrew this setup and opted for more. Unfortunately, due to Timex's lack of any kind of marketing, he moved out of the Sinclair arena and into the mainstream. When I had my conversation with him, I realized that like many others, he was unaware that there was more than one model in the Timex/Sinclair line—let alone Sinclair models which did not have the Timex name attached. The T/S 2068 was unkown as was the Spectrum and QL. Here was the perfect example of how Timex (and Sinclair as well) literally threw away a potential market.

But, on the other side of the coin are the thousands of Sinclair owners/users who have continually followed and sought out information about our computers. It is this group to whom the second annual Midwest Timex/Sinclair Computer Fest is dedicated.

Frank Davis, one of the original organizers of last year's successful gathering in Cincinatti has announced that once again Sinclair users are being invited to take part in two days of total immersion in Sinclair awareness.

The dates for this year's convention are Saturday and Sunday, May 2 & 3 in Indianapolis, Indiana. The Holiday Inn North is the site. It is located on Interstate Highway 465 (3850 DePauw Boulevard, Indianapolis, Indiana 46268; (317)872-9790 or (800) HOLIDAY). A special rate of $52.00 per night has been arranged for attendees who mention that they will be attending the Computer Fest. The location addresses the problem of easy access from the airport which had been one of the few criticisms of the Cincinatti show. Only minutes from the airport, there is a hotline telephone to the Holiday Inn which provides a minivan to and from the airport.

This year there will be 6000 square feet of display space as opposed to the 2400 last year. Two lecture rooms will be in use and popular sessions will be able to be repeated for the benefit of those who cannot attend the initial presentation. (I have again been asked to present one or two during the course of the weekend. I hope to see many of you there.) Flea markets and swap meets will be arranged as well, although precautions have been taken to prevent unauthorized distribution of commercial copyrighted software. Vendors and users groups are being invited to take a table or tables at very reasonable rates.

For additional information send a self addressed stamped envelope to Frank Davis, 513 East Main Street, Peru, Indiana 46970. No phone calls please.

Continuing on the theme from last month, Sinclair telecommunications, we look now at a package for the T/S 2068 from Grey & Clifford Computer Products (P.O. Box 2186, Inglewood, CA 90305; (213)759-7406 or 516-6648). This package consists of both hardware and software for the Spectrum emulated T/S 2068.

The software portion of this product is called Specterm 64. Working on a Spectrum (or Spectrum emulated T/S 2068), Specterm 64 produces a 64 column display. (A T/S 2068 version is in the works, check for availability.) The 64 column display is produced without the addition of any hardware. As supplied, Specterm works at 300 baud with the Westridge 2050 modem. A minor modification to your 2050 modem will allow you to use Specterm 64 with Sinclair microdrives.

As is necessary in any new terminal program, Specterm supports the popular Xmodem protocol for file transfers. With just a few keystrokes you can load any Sinclair BASIC program, machine code or text file into the buffer, which is more than 35K. Only a few keystrokes are required to transmit what you have loaded into the buffer, or download material from a remote source. Another few keystrokes you can save to tape anything you have downloaded to the buffer.

Specterm 64 supports X-on/X-off, full or half duplex and Caps Lock and lowercase. All necessary information is included with the documentation to enable you to modify this software to suit your particular needs. Most mass storage devices can be utilized with only slight modification.

The hardware portion of this package is the Z-SI/O interface card. This card allows Specterm 64 to drive any RS-232 modem, allowing use of a standard modem. This RS-232 card for the T/S 2068 can be used for anything that RS-232 ports are used for on other systems. In addition to a modem (including Hayes compatible modems) it can be used to drive a printer or plotter. From the same people who produced the Z-Link Spectrum hardware adapter, the Z-SI/O card comes with a 25 page manual and software listing that will enable you to get started using the device right away.

The Z-SI/O card has all 64 contacts of the T/S 2068 expansion buss fed through so that all additional hardware using the expansion port can still be connected.

For more information write to G & C Computer Products and mention that you read about it here in *Computer Shopper*.

I recently received a package from Electret Scientific Company of Star City, West Virginia entitled Musician Royal. This is a series of four programs for transcribing (composing), playing and saving music on your T/S 2068. Musician Royal is the main program with which you will compose your music. The Music Box program automatically accepts up to eight compositions transcribed with Musician Royal and plays them in any sequence, tonality or tempo. The Demo Album program contains six representative compositions composed by the creators of this package.

Even before I started to give this program a once over, I was impressed by the users manual and packaging of the cassette. While cassette labeling is no indication of the quality of the software recorded upon the tape, the professionally printed, gold stamped label indicates to me that this is not just something thrown together in a hurry and marketed from a back room or basement. My main criteria, however, is the well put together manual which contains clear instructions and illustrations to guide the new user through the process of creating a composition.

Musician Royal uses the BEEP command on the T/S 2068 to create the music. The publishers say that if this version is well received, an enhanced version will be released which will take advantage of the more sophisticated SOUND command. Since only the BEEP command is utilized, the music produced by this software is only a single voice. Once the advanced version is released, multiple voices will be supported. Since the speaker on the T/S 2068 is far from the best, it is suggested that you play the music created by this package through a cassette recorder, T.V. or audio system by way of the MIC port on the computer.

For those of you who know little or nothing about musical notation, an entire chapter in the manual is dedicated to this purpose. Treble and bass clef are shown and the notations that are used on the staff are shown and explained. (Being a viola player myself I could not but wish that the alto clef was also included in this program.) Notes above and below the staff are allowed by Musician Royal. Key signature (sharps and flats) is discussed as is the time signature (meter). The various note lengths are described from a whole note to sixty-fourth notes. Even such sophisticated incidentals such as ties, accidentals, fermatas and repeats are included in the program's ability and are described in this chapter.

In order to help you learn to use this program, the publisher has included a sheet containing three pieces of music which is used as a demonstration of transcribing to Music Royal. The instructions in the manual are written using this music.

With an attached printer you can have a permanent hard copy of your work. You should be aware, however, that you will not print a manuscript with staves and musical notation, but a list of notes using normal alpha-numerics.

You are first prompted for a name of your composition. You will then be required to input the number of sharps of flats in the key signature and the time signature of the piece. To enter a note into the composition you first have to indicate the pitch of the note (A-G) and the duration of the note. Entering bar lines at the end of a measure is optional but recommended for clarity. Audible signals are matched with the on-screen prompts. A single BEEP indicates that the software is looking for a note, and a double BEEP coincides with a request for a value of the previously entered note.

Music Royal even includes a form of block copy as in a word processor. In order to repeat a phrase previously entered into your composition, you use the program's "duplication" mode. You tell the computer the first note that you want duplicated along with the final note of the phrase. (If your printer is on, all of this will be printed as you are working.)

Once done with this initial phase of composition you will want to go into the PLAY-EDIT mode. In this mode you will be offered three choices; play the composition; edit the composition, or add more notes. If you choose to play the composition you will be asked for the desired value (in seconds) of a whole note. This will determine the tempo of the playback. The longer the value for a whole note, the slower the piece will be played. Next you will be asked for the note at which to start the playback as well as the final desired note. This is particularly important for editing small sections of your work. If there are any notes you wish to change you can then go into edit mode.

There are three different manners in which you can SAVE your composition to tape. The first option is to SAVE the composition as part of a collection of melodies. By using separate tapes, you can create a number of different collections of melodies. The second option is to SAVE the composition as a printout of the data for the composition; name, tempo, notes and rests. This data can later be used to input the information for in-

continued on page 314

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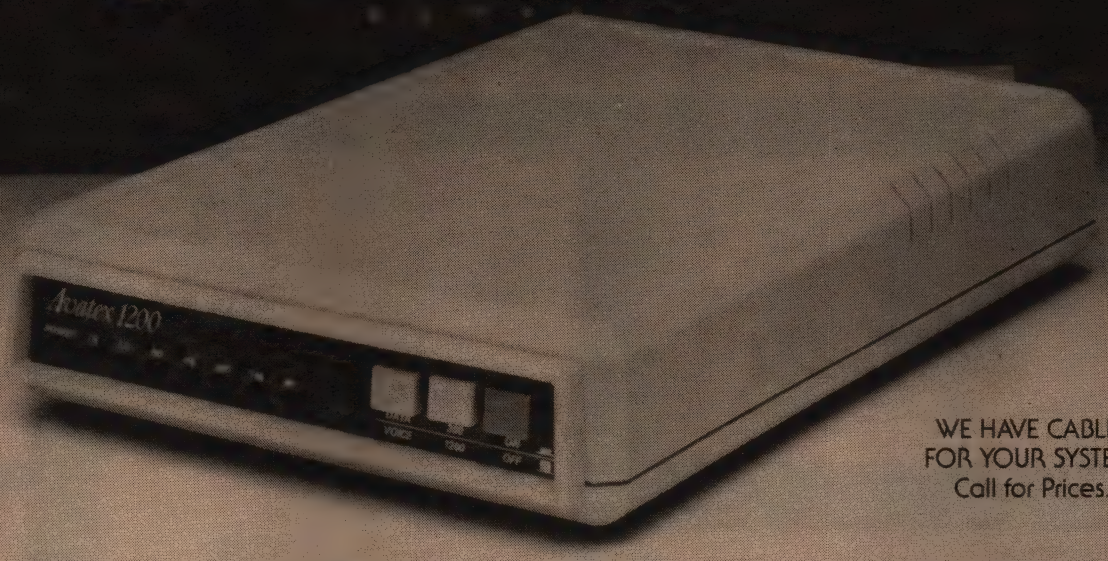

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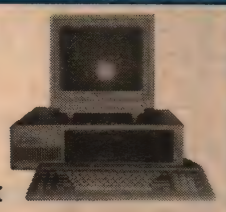

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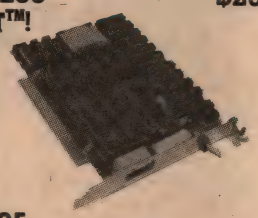

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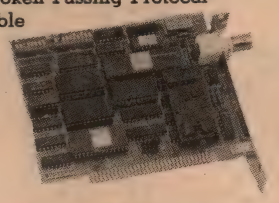

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COMPUTER BOOKS

Books On Excel Bring Help To Mac Users

Reviewed by Cheryl Peterson

Excel is one of the most complicated programs in common use by Macintosh owners. So it is only natural that many book publishers have taken the opportunity to bring out books explaining how to use it. While some of these are simple tutorials, others deal with specific applications. Here's a look at four of them.

Making Your Macintosh Excel
By Bill O'Brien
Scott, Foresman and Co.
295 pages; $19.95 (softcover)

Is the documentation for Excel so bad that the world needs a separate book to tell everyone how to use it? Is *Making Your Macintosh Excel* just another opportunistic piece of drivel purported to make an already well understood program easier to use? Or is this a case of hopelessly confusing instructions being illuminated by an insightful and witty author well versed in the use of the Macintosh?

Excel's documentation is no worse and considerably better than that provided with many other programs. The docs are informative, complex and somewhat tutorial in nature. But no fun to read. With some fiddling and a bit of familiarity with the Macintosh, the experienced spreadsheet manipulator would have little difficulty using the basic functions of Excel.

Making Your Macintosh Excel on the other hand is informative and witty. While it presents helpful hints and tips, using good samples and illustrations, it also is entertaining to read.

Printing pages and page sized sections of a larger spreadsheet are explained with a diagram that instantly gives an understanding of the overall picture. The illustrations and samples in areas like this really standout.

An experienced Excel user told me that if *Making the Macintosh Excel* told how to turn off the gridlines when printing a spreadsheet the book would easily be worth the $20 to him. It does. In fact, it also tells how to disable the grid on the screen. Though the information is available in the manual, it isn't emphasized so it's easily glossed over.

One interesting section is a set of scripts for creating six useful applications. Another outlines the use of macros to simplify spreadsheet creation.

Making Your Macintosh Excel also has a section on using the Switcher and the Minifinder. These useful extras aren't even mentioned in the Excel manual.

The five appendixes give useful data in table form. One appendix details instructions and limitations for moving data from one spreadsheet program to another and back again. Another lists all of Excel's functions in alphabetical order.

For the busy person who knows spreadsheets and doesn't feel like wading through Excel's docs, this is definitely a good buy. Well-written, using simple explanations and plenty of illustrations, this one's worth the dough.

Running Your Business With Excel
By Amanda C. Hixson
McGraw Hill
353 pages; $19.95 (softcover)

Running Your Business With Excel shows the reader how to create useful spreadsheets that handle tracking most of the bookkeeping done for a small business. Included are instructions for generating a cash disbursements journal, sales journal, profit and loss statement, amortization schedule, inventory database, automatic invoice and an automated payroll journal.

All the instructions are tutorial in nature and presume only that the reader knows the basics of using a spreadsheet and the specifics of using the Macintosh user interface. The writer doesn't seem to expect more than a casual acquaintance with Excel. This means that she doesn't talk over the heads of most computer users.

The author addresses all of Excel's many capabilities from spreadsheet generation to database and charting functions. A chapter on macros introduces more than a few good shortcuts. A chapter on MacSwitcher explains this valuable tool and how it's best used with Excel.

The book handles many of Excel's most complicated abilities only after establishing the groundwork needed to understand what they can do. The book does an admirable job of building the reader's knowledge step-by-step. Once the spreadsheet and linking functions are explained, she progresses to the database functions, lookup information and incorporation of tabular data. Later she deals with variables and arrays.

Separate chapters on charting and printing give further shortcuts and illustrate how to pretty-up the display of your data.

None of the applications are supplied or offered on disk, so the "student" must enter them in manually. This can be good or bad depending on how much you already know about Excel and how lazy you are.

While the applications are created specifically for Excel, the principles upon which they are based are not exclusive to Excel. I took the amortization program and entered it into the Scribble! spreadsheet program on an Amiga and found that with very little modification it functioned quite well. Many spreadsheet programs do not handle database and charting functions, but the principles involved in creating the applications can be applied to most businesses and many spreadsheet programs.

This is a well-written book with lots of valuable tips and information. With the exceptions of extremely well-versed Excel-using business persons, everyone can learn something from this one. I personally would have like to see a disk offered, but I'm the lazy sort who isn't likely to spend hours entering each and every application. I must confess, there isn't a single one that wouldn't be useful to a small business.

The easily-removable handy reference card of Excel keyboard commands at the end of the book is a nice touch.

Planning and Budgeting With Excel
By Jeffrey R. Alves, William Fletcher and Dennis P. Curtin
Osborne/McGraw Hill
439 pages; $17.95 (softcover)

Going into this book, I expected to be a bit bored by yet another book filled with sample spreadsheets and pages of repetitive instructions for creating them. While there are certainly many pages of instructions, the meat in between is well worth the reading. Surprisingly, this book spends a lot more time discussing planning and budgeting than it does explaining Excel. After reading the credentials of the authors, this isn't so strange.

continued on page 293

The Information Decade—A Challenge To Anyone In Publishing

by InfoSource

Booksellers have a favorite myth that they tend to dispell. Customers often think that working in a bookstore allows you—the bookseller—to read all your favorite books! NO! The chances for a bookseller to read are few and far between! However, a few nights ago, sitting with my feet up reading my favorite computer magazine—after *Computer Shopper* that is—I came across an article on educational computing and the impact that computers were having on children, college students and their teachers. What set my mind reeling was a statement that computers were only made available to the general public on a mass basis ten years ago. Visions of garages, the Homebrew Computer Club, and all that we associate with Apple, the Altair and all the others "way back" in '76/'77, has it really been ten years Has a then non-existent industry developed in so short a time?" It came as quite a shock that ten years had gone past and to look back to see what had transpired.

Going into the bookstores these days, in most cases, you will find some representation of computer book titles, not only that, but now a large percentage of bookstores are fully computerized and they would be hard pressed trying to run the operation efficiently without a computer system. Ten years ago even the manuals for the hardware were virtually non-existent and unintelligible to the layman. Now, we publish our own books! Desktop publishing is allowing it to happen. I sit in my office and via CompuServe communicate with the world! There are books on finding one's way around CompuServe. Ten years ago even the most astute of technical booksellers would have been hard pressed to answer customer's questions on telecommunications and data transmission. Now most anyone can point you in the right direction, if not suggest the most useful title. Looking around the shelves, we now see titles on CAD, CD-ROM, CAP... Hah! Who is concerned about 10 years ago, two years ago these things were not widely available on micros !!!. Now CADpak is on my shelf along with Outthink, Sargon and all the rest of the other software.

Soon it seems that the 80386 will be placing, as some have termed it, a "deskframe," in our offices and eventually in our homes. Could Admiral Grace Hooper, who formulated Cobol on a mainframe, foresee that the power that was then available on mainframes would someday sit on a desk. Not only some day, just a very few years later.

A few days ago, a call was received from one of the local school teachers. "Do you offer volume discounts?" Replying in the affirmative, I asked for which titles she was interested in obtaining. The shock I got when I learned that AutoCAD was being used in local schools! This whole revolution has happened and a generation is growing up and going to school not knowing what it is like NOT to have a computer in the classroom. What will these students have learned and how will they apply it?

Bearing in mind that it is difficult to prophesy (especially with regard to the future!), one really is set to wondering what the next ten years will hold for this technologically orientated generation. What will it be in the *Computer Shopper* article in 1997? What new technologies will there be? Perhaps I will then be able to agree with my customers, that because of time saving computerization, I CAN read books in the bookstore. ●

Top Ten Computer Book List April 1987

The following list includes titles that have been popular with *Computer Shopper* readers during the past month. The list is compiled by InfoSource, and is not strictly the list of numerical best sellers nationwide. However, every title on the list is a best seller. If the titles listed are not available in your local bookstore, they can order them for you, or you can get them directly from InfoSource, Box 21092, Midtown Station, New York, NY 10129, (201) 595-4505.

Working Out With AutoCAD
Lubow
New Riders Press
$29.95
Pages: 280
Copyright: 1986

Working Out With AutoCAD contains seven exercise sets and twenty-three structured exercises. It covers advanced setup techniques for AutoCAD and includes the use of MS-DOS to organize system layout. The exercises cover advanced drafting techniques, drawing libraries with symbol libraries and creating macros using AutoCAD V2.5 and AutoLISP.

The title contains over fifty macros integrated into the drawing exercises. These include AutoCAD command macros, drawing macros and advanced macros developed in AutoLISP, AutoCAD's LISP programming language. This more advanced title will be of use to readers already conversant with AutoCAD.

Inside AutoCAD (2nd ED)
Raker & Rice
New Riders Publishing
$34.95
Pages: 309
Copyright: 1986

Raker and Rice tell the inside story of how to use AutoCAD and they give a "hands on" feel for the program. Contents include Setting Up AutoCAD, Getting Around, Graphics Primitives, Introduction to Editing, Drawing enhancements and much more. An easy step-by-step introduction with over 300 drawings explaining the use of AutoCAD and handy references for setting up the program for professional drafting and design work. An ensuing title, more advanced and more technical than the above is *Working Out With AutoCAD* [$29.95] (New Riders Publishing)

Supercharging MS-DOS
Van Wolverton
Microsoft
$18.95
Pages: 352
Copyright: 1986

Van Is Back!!! Running MS-DOS sold 300,000 copies!! Now *Supercharging MS-DOS* takes readers several steps further in understanding and using MS-DOS. Users primarily in the business and university market who have a basic understanding of MS-DOS will want to explore its intermediate possibilities. In a style that has been praised by reviewers and computer users (as well as booksellers!) Wolverton shows users how to customize the behavior and appearance of an MS-DOS compatible machine.

Advanced Techniques In dBase III Plus
Alan Simpson
SYBEX
$22.95
Pages: 500
Copyright: 1986

One of the best choices for the experienced dBase programmer. The title explains database design, program design and structured programming to Plus users. The primary focus is on developing user friendly, customized programs and the examples cover many aspects of different business solutions, including inventory and accounting systems. Simpson has become one of the most popular dBase authors and has a consistent presence on best seller charts.

Running MS-DOS (2nd ED)
Van Wolverton
Microsoft Press
$21.95
Pages: 500
Copyright: 1985

The second edition of this highly successful title is updated to cover MS-DOS through 3.1. This is truly the cornerstone book for any serious MS-DOS user's library. Quote *PC Week* "...written in that strange and wonderful tongue called English." Van Wolverton has worked at IBM and Intel. A similar title is the *MS-DOS User Guide* by Devoney [$19.95] (Que) and *Introducing PC-DOS and MS-DOS* by Sheldon [$18.95] (McGraw-Hill)

80386/80286 Assembly Language Programming
Murray & Pappas
McGraw-Hill
$19.95
Pages: 537
Copyright: 1987

This comprehensive guide enables serious programmers to take full advantage of the unique design of the 80386 and 80286 microprocessors which have recently burst onto the market. The authors carefully detail the use of assembler pseudo-ops; macros, procedure and libraries; and testing and debugging techniques. Experienced programmers have an invaluable reference to the 80386/80286 instruction set. Also see *Programming The Intel 80386* [$21.95 tentative] (Scott Foresman) Due Feb '87.

***Using 1-2-3* (Includes Release 2)**
Leblond
Que
$21.95
Pages: 540
Copyright: 1986

This new edition of the classic *Using 1-2-3* highlights changes well. 125 extra pages and a tear out chart are now included. This title must surely rank amongst the greats when it comes to GOOD books on 1-2-3. Other titles in this series include *1-2-3 Macro Library (2nd Ed)* [$19.95] and *1-2-3 Tips, Tricks And Traps* [$19.95]

Complete Turbo Pascal (2nd Ed)
Duntemann
Scott Foresman & Co.
$22.95
Pages: 528
Copyright: 1986

The second edition of this best-selling book offers a complete guide to the latest version of Turbo Pascal, Release 3.0. Written for programmers new to Pascal, this is an excellent guide to Borland's best selling *Turbo Pascal Compiler*. After a complete tutorial on the Pascal language, there follow detailed instructions on installing, modifying and using Turbo Pascal on both MS-DOS and CP/M systems.

Contents include the following: Techiques for structured programming and program design, a guide to using Turbo Editor, Instructions on Turbo Pascal commands and overlays, explanations of the extended Turbo Pascal features not covered in the manual. This very readable, comprehensive guide includes dozens of examples—from the very elementary practice problems to large, complex programs. The author includes explanations of Turbo Pascal error messages as well as a detailed glossary. Other titles include: *Advanced Turbo Pascal* [$18.95] (Osborne McGraw-Hill) *Turbo Pascal: A Problem Solving Approach* [$18.95] (Addison-Wesley) and a recent arrival on the scene *Turbo Pascal Program Library* [$19.95] (Que) *Turbo Pascal—Advanced Applications* [$16.95] (Rockland).

Understanding dBase III Plus
Alan Simpson
SYBEX
$19.95
Pages: 415
Copyright: 1986

dBase commands and concepts are illustrated throughout the book with practical, business oriented examples—for mailing lists, accounts receivable and inventory design—PLUS scores of expert tips and techniques. *Understanding dBase III Plus* covers interfacing with Lotus, Visicalc, Wordstar, and upgrading from dBase II. Other titles include: *Mastering dBase III Plus* [$22.95], *Advanced Techniques In dBase III Plus* [$22.95], *dBase III Plus Programming Tips And Techniques* [$19.95] (Ashton-Tate).

Also available are the *dBase III Plus Handbook (2ED)* [$19.95] (Que) as well as the *dBase III Plus Applications Library* [$19.95] (Que)

Using Turbo Prolog
Robinson
McGraw-Hill
$19.95
Pages: 300
Copyright: 1986

Using Turbo Prolog allows the programmer to maximize coding skills with this new compiler from Borland. Using multiple windows to view and modify programs while they run, this title allows you to learn programming techniques using color graphics, turtle graphics and sound. Offers detailed coverage of Prolog statements, functions and operations.

Managing Your Hard Disk
Berliner

continued on page 293

Tentative Spring List

At deadline, February, we had only just been notified of new book titles to appear in the first six months of the year that I am certain will appeal to *Computer Shopper* readers. Regrettably, a large percentage of these titles, have no "blurb" available as yet.

Building Your Own PC/XT Or Compatible.
By: Pilgrim
From: TAB
Due: 2/87
Price: $14.95

Expert Systems For Technical Professionals
From: John Wiley
Due: 4/87
Price: $29.95

Building Expert Systems
By: Baker
From: Addison Wesley
Copyright: 1/87
Price: $39.95

How To Look It Up On Line
By: Glossbrenner
From: St. Martins
Due: 3/87
Price: $14.95

Micro-Computer CAD Manual
By: Rice
From: PGW
No Date
Price: $27.95

Official Geos Programmers Reference Guide
Pub: Bantam
Due: 7/87
Price: $19.95

Apple IIgs Book
By: Molly
Pub: Bantam
No Date
Price: $18.95

Apple IIgs Toolbox Revealed
Pub: Bantam
No Date
Price: $21.95

dBASE Mac In Business
By: Held. Ashton-Tate
Due: 3/87
Price: $19.95

dBASE Mac Performance Guide
By: Loggins
Pub: Bantam
Due: 4/87
Price: $21.95

Complete Guide To dBASE Mac
By: Shafer
Pub: Scott Foresman
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Build Your Own Remote Controlled Robot
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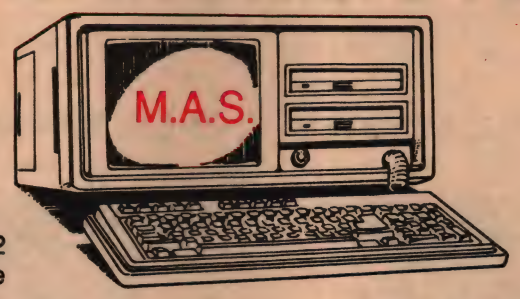

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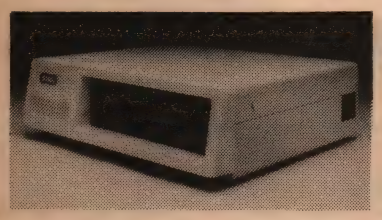

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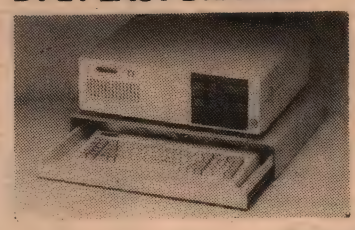

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TEXAS INSTRUMENTS

TI Forum

by Ron Albright and Jonathan Zittrain

The Winners!

What a pleasure to do this month's column. We get to report on the terrific response from the TI community to the First Annual TI Forum Programming Contest. I would like to thank Jonathan Zittrain and Howie Rosenberg for judging the BASIC/Extended BASIC and "Other Languages" categories, respectively. They did so with great alacrity, diligence and devotion. Also, to the sponsors—Disk-Only Software, Compuserve's TI Forum, MICROpendium, Genial Computerware, and Asgard Software. We now look forward to a second contest—a different kind of contest—that you can enter even if you can't program (hint, hint). Details in the next few months. We also hope to have a Second Annual Programming Contest next fall, if there is an interest. Let us know. Now, on to the reports from the judges.

Jonathan Zittrain BASIC/Extended BASIC

Many fine programs were submitted in the Extended BASIC category of the contest; the judging was extremely difficult. Originality, program structure, documentation, and user friendliness (including error tapping) were all taken into account.

The first prize winner is Bill Knecht's "Tourist Information Services." Its purpose is straightforward: to quickly provide the name, phone number, and address of tourist information agencies for all the states of the U.S. The code was tightly written and well-documented, the program easy-to-follow and impossible to crash. Tourist is a fine example of how data can be organized and stored for fast, easy retrieval.

The program consists of four files, but only three are required to start—the fourth is constructed during setup, saving 52 sectors in transit, another innovative idea. A provision is made to print the entire list of data as well as update it, all smoothly linked.

The first runner-up is Jack E. Shattuck's "Handy Dandy Adder" program. As Mr. Shattuck put it, it's not extremely "profound," but it__is__a model of programming structure and user interface. Those familiar and comfortable only with mechanical adding machines can easily adapt to ADDER, entering numbers quickly while getting a running tally, average, and other helpful information.

Too often an attempt to computerize a particular task ends up making the task more difficult—sometimes a pencil and paper or even a calculator can do a job more efficiently than any computer program. ADDER proves that computers can help even with seemingly simple tasks. Options to print the results of the tally and the tallying process are also included, although only a PIO (parallel) port is assumed by the program. RS232 is certainly a possible printer port for many users, and even the thermal printer—TP—would perform well in printing the results of the program.

Second runner-up is Mike Stanfill's "Fontastic," a program that not only assists in designing and modifying character sets for BASIC or Extended BASIC programming, but also a CHARA1-type file for use with assembly programs, such as TI-Writer. Utility rated high, as did the source code and originality. Documentation was provided within the program, enough for most users interested in this type of utility to go on.

File name and translations (between merge-files and CHARA1-type files) were a bit difficult to work with at first, and some of the prompts required some guessing, but the program was generally forgiving of errors. The character editor was easy to use and rather powerful; the results of an edit can be immediately displayed and contrasted with the rest of the character set.

Fonyastic is definitely a commercial-grade program, and no doubt will make a name for Mr. Stanfill in the TI world in the year to come. With the advent of different CHARA1 sets and the desire for original-looking program displays, Fontastic will find a place in the programmer's toolkit.

There are also some programs submitted worth honorable mentions; again, the caliber of the programming was astounding. With such talented software authors still at work, the TI community has little to worry about stagnation or obsolescence.

Here are some of the highlights of the Extended BASIC entries:

Ken Kopecky's "Stamp Inventory" is another fine database program, allowing for 190 stamps to be filed at a time in an easy-to-use format. The displays are standardized and the data neatly formatted, even allowing for a comment with each stamp. Extensive use was made of subroutines, something that too few programs consider.

"Videominder," by Mark Larry, does for videocassettes what "Stamp Inventory" does for stamps. It allows for different genres of videocassettes (e.g. horror, drama, children), and at what number on the counter the movie begins. The user can modify the working environment within the program, changing printer port and screen colors. The program also recognizes the CorComp clock card.

Chip Chapin's "Labelgen" is one that rated very highly in the utility category. Labels are generated that include user comments and clean formatting for disks, especially helpful to those that sort disks and file them. The documentation was the best of all the entries, leading the user step-by-step through many of the options. This, like "Fontwriter," is a program that clearly stands out as commercial-grade.

"Multi-Cat," by Chuck Reinhart, catalogs multiple disks, sorts the file names, and keeps a running file of a software library. Keywords can be entered and a search through the names is quickly done, helping the user find a particular file among many disks. Putting Multi-Cat and Disk Labeler together would form an incredible disk filing system! The programming and user interface both rated highly, as did the utility.

Joseph D. Goins' "Mindwarp Trivia" quizzes the user on various topics, from Disney to origins of state names. It was one of the best all-around programs, combining strong showings in each of the five categories.

The above programs show what a wide variety we received—and what incredible quality is out there in the TI world. Our sincerest thanks to all who entered. It was a pleasure to evaluate the Extended BASIC program.

Howie Rosenberg (C99, Pascal, Forth, other)

The category 3 winner is Charles E. Kirkwood for his program Cryptogram written in C99. Cryptogram is a cryptogram solving aid not unlike several others which have appeared in the recent past but with enough "extra" to make it a winner. The program as it relates to the 5 scoring parameters is as follows:

A) Originality: There have been other programs which can serve as cryptogram solving aids. In this category the program is not outstanding. Nevertheless the task is well handled and the program designed quite well to fulfill its purpose.

B) Source code: In this category Cryptogram is unsurpassed. The source code is well commented. If the judge had any doubt as to how well the program was structured, the accompanying flow charts made short work of them. These flow charts are a model for all novice programmers (and experienced programmers too) to follow in program design.

C) Documentation: Little is required as the program is well engineered from a user standpoint. The short text file that accompanies the program and which can be called from the program is perfectly adequate.

D) User Interface: As stated above, the user interface is simple enough to make the use and reference to external documentation unnecessary.

E) Utility: The program is designed for a specific purpose to aid in the solving of cryptograms. For this purpose it is very useful as it allows for rapid trial and error of various permutations of letter substitution so necessary in solving letter substitution crypts and so messy on paper, the usual method. As compared to other versions I have seen (written in XB, the speed increase of this C coded version make it useful indeed.

Ron Albright (Assembly Language)

This category was difficult to judge, at best, but I feel comfortable with the winner. Frederick Humburg's "SPY—Your Eyes Inside the TI" was a beauty. Commercial quality (and, no doubt, soon to be "buyable") and well-done characterize this tool for exploring the "innards" of the 99/4A. It came on with 200 sectors or so of tight assembly source code, printed documentation (as well as a disk file) and the SPY itself in a condensed object code version (for loading from Option 3 of the Editor Assembler module) and a version to be CALL LOAD(ed) and CALL LINK(ed) from BASIC using either Mini-Memory or Extended BASIC. After a nice title screen, you go to the SPY's "operating screen" itself. From there, you can, with single key presses, scroll through (in 256 byte chunks) any form of console memory—CPU, GROM/GRAM, or VDP RAM. You can also change the display to be in hexadecimal, character, or mixed. You can also scroll through any of 6 screen/character combinations. You can also experiment with the computer's use of arithmetic and logic operations on hexadecimal, decimal, and binary forms of numbers. It is a marvelous program. I hope it becomes available to the users soon. Nice job, Mr. Humburg.

Overall Winner

For some very unfair reason, ingenuity, particularly in the computer world, is disproportionally represented in the young. One of the brightest young programmer's to come along in the TI community is J. Peter Hoddie, president of the TI SIG of the Boston Computer Society. Besides being a full-time college student, running his large computer group, releasing the smash-hit "Font Writer" software ($24.95 from Asgard Software, P.O. Box 10306, Rockville, MD 20850), and planning several new releases through Genial Computerware (write them for some exciting developments—835 Green Valley Drive, Philadelphia, PA 19128), he had time to write a beauty for our contest. Dubbed "XB:BUG," this is both a novel concept as well as an extremely useful utility. In brief, you load XB:BUG into the Extended BASIC environment and there it sits. It is invisible until invoked with the SHIFT-CTRL keypress. Then, it leaps into action ready for a command. If you are running a program at the time, it stops (sprites keep in motion, of course, but program execution ceases). From the XB:BUG command prompt, you can enter any of about 10 functions. With the "A"rray command, you can inspect the contents of an array, "B"reakpoints displays the cur-

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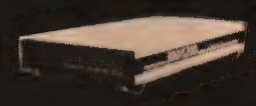

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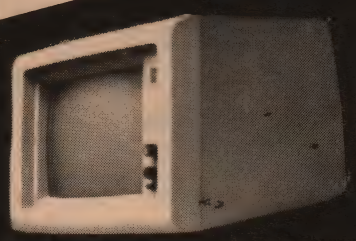

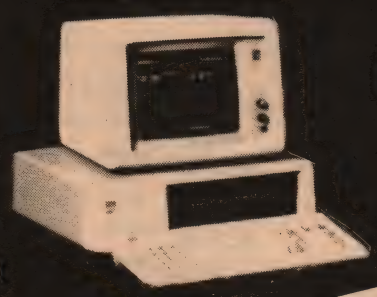

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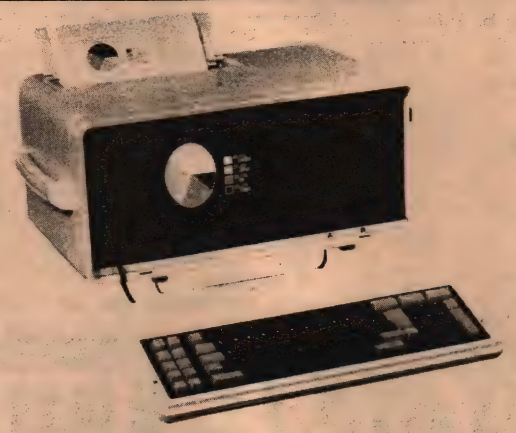

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HEATH/ZENITH

The Next Greybox Generation

by George M. Ewing

New Developments in The 8-bit Heath World

It's a familiar story by now. A company develops and markets an 8-bit computer, gains a loyal following, and supports it with hardware improvements and new software for a few years, then it either: a) goes out of business or is gobbled up by a competitor, or else b) brings out a brave new 16 or 32-bit machine, and phases out the older model fairly rapidly. In either case, the users must then abandon their machines and join the rush to the new standard, or else be left dangling, with only limited third-party support as the parent company devotes all its resources to the new machine. There are exceptions to this pattern, such as the Apple II and the Commodore C64, but the general trend towards "orphanization" is quite clear.

The Heath H-89 is a 1979 design, which means that it is coming up on a mind-boggling and decrepit eight (8!) years old in an electronics world where products are often obsolescent before they even make it to the market. The H-8 is even older. Still, the Heath/Zenith 8-bit user base is actually expanding slowly, and the loyal H-89 and H-8 users may very well be one of the groups to successfully buck the general trend for a number of reasons:

1. Heathkit users are often technically more savvy than the average home and personal computer user, and consequentially, less vulnerable to the eventual loss of factory service and support down the road. This is not too surprising; we would expect it from a group of users who assembled their computers from kits in the first place. Not every Heath user was born with a soldering iron and a thick yellow manual in his hands, but the big pool of experienced HUGgies out there dispensing help and technical advice has a big impact on other users who may have bought a factory assembled Zenith machine, or bought a machine second hand. All that support tends to keep older machines in use, rather than gathering dust on a closet shelf. It particularly works to the advantage of the growing class of second-hand H-89 and H-8 users. These are people who couldn't afford to pay $1,800 five years ago for a computer, but who are perfectly willing to pony up a few hundred dollars now for a used machine in good condition, especially if it comes with a lot of extra goodies, as well as a bushel of second hand software.

2. In some ways, the advancing age of the H-89 may actually serve as a distinct advantage. The H-8/H-89 (and Z-80 8-bit systems generally) are now approaching the end of their "mature technology" stage. They are old enough that replacement parts are now very cheap, but not quite old enough yet that parts are too difficult to get.

3. Heath has had a long and honorable history of product longevity in non-computer areas such as test equipment, audio systems, and amateur radio gear. Heath equipment from the 1950s and 60s, a prehistoric era for electronics by modern standards, is still in everyday use all over the world. A lot of this will undoubtably carry over into the computer universe. Certainly, the new beige MS-DOS turbomegaboxes can do many things a CP/M Z80 computer can't, but the Z80 machines still work fine, and can probably be kept running almost indefinitely, if anyone wants to bother.

4. The popular H-19 terminal design and the CP/M operating system are important rallying factors. There are "only" a couple of hundred thousand H-89s out there, plus a few thousand H-8s. However, there are many more H-19 stand-alone terminals in service, many of them still in use on other old CP/M computers, such as S-100 systems. Since the H-19 with its ANSI, VT-52, and character graphics modes has become an important standard, nearly all developers of new generic CP/M software support it. (Yes, Gonzo, there ARE still a number of smaller companies producing new programs for CP/M!) This means a much bigger potential market for Heath-compatible CP/M software than just the H-89s and H-8s alone could provide.

5. A moment ago I said the user base for H-89s was actually expanding slowly, though Heath officially stopped manufacturing the machines years ago. How can this be?

continued on page 294

SigmaSoft's CAD-89

by Peter Ruber

An application on 8-bit computer systems that could never be fully realized was the use of high resolution graphics for Computer Aided Design. Even simple design programs employing bit-mapped graphics quickly ate up the remaining bytes on a typical 64K CP/M system.

Until the PCs came along and broke the RAM barrier, most CAD/CAM work stations like the Tektronix terminals were tied into minicomputers who offered a distinct speed advantage in addition to big chunks of RAM that could absorb the never ending program lines and display the image designs on the screen.

Thanks to some enterprising people at SigmaSoft & Systems, owners of the H/Z-89 and the older H-8 computer using an H-19 terminal, can now venture into the fun world of Computer Aided Design with a neat set of components called the UPI, the IGC, CAD-89, and Mouse.

A few years ago, while studying computer science at college, Clay Montgomery decided to build a sound board for his H-89. Members of the Dallas area Heath Users' Group wanted one too, so Clay ordered some manufactured PC boards, soldered in the ICs, and went into business for himself. A short while later, he designed a parallel interface card that also attracted the Heath fanatics.

In 1984, he began to realize that his little parallel card (called the Universal Parallel Interface or UPI) could be used as an interface for a possible graphics card that connected to the '89s Terminal Logic Board. So he designed the Interactive Graphics Controller (IGC), and with former classmate Darron J. Shaffer, who came to work for him, wrote a new graphics language that did not require any high-level language programming skills on the part of the user.

The IGC's graphics language used simple English commands such as Circle, Arc, Clear, Cursor, Dot, Erase, Draw, Pan, Style, Paint, etc. to create a screen display. Positioning followed the conventions of the Cartesian coordinates (x,y) and the language was attached to the CP/M or HDOS operating systems by means of a device driver.

Users could write a series of instructions using a basic text editor, and PIP the file to the IGC for execution. More sophisticated users who like BASIC or Pascal could use them with the IGC. Since these are highly structured languages, the amount of code needed for the execution of a routine was sometimes three to four times the length of the code used by the text editor method.

The IGC had a number of interesting features. You could install 256K RAM, which you could use as a contiguous bank, or break it into smaller units. The system supported interlaced graphics resolution up to 640x480 for some extraordinary effects. When the IGC was not used, its features did not go to waste. You had the option of assigning some or all of the memory as a silent disk for sorting large database files, or as a print spooler. If you reset the computer, the IGC was buffered so that it's own memory would not be affected.

During the past year, SigmaSoft's UPI was revised to include a combination floppy and hard disk interface that allowed Winchesters with a capacity of up to 67-MB to be used on the H-89 through a Western Digital controller card.

After much expectation, SigmaSoft has now released a full-fledged Computer Aided Design program called CAD-89, that can be used through keyboard execution or with a mouse. It is fast and powerful.

CAD-89 is an object oriented type editor. Rather than drawing pixel patterns and images that are very difficult to edit and store, CAD-89 builds a drawing list of objects as they are "rubberbanded" by the user in an interactive manner. Objects such as lines, circles, dots, boxes, arcs and area paints are entered in seconds by simply positioning a graphics cross-hair cursor with any of several graphics input devices (either an optical mouse or keypad arrow keys). Groups of objects called symbols can also be drawn by the user and duplicated elsewhere in seconds. Whole drawings of electrical schematics, printed circuit board layouts, architectural and mehanical drawings can literally be drawn on the screen as fast as they could be drawn on paper with a pencil and ruler, but with greater precision, and easier editing.

CAD-89 has an advanced drawing list architecture that permits many powerful editing functions to be performed instantly. These include clipping, flipping, scaling, 90-degree rotation, and erasing. Any object or symbol in a drawing can be moved, modified or deleted without redrawing any other objects or symbols in the drawing, even if they are drawn close to, or on top of, other objects that you don't wish to change. Completed drawings or symbols can be stored to disk files in a compact format and then read back from disk at any time in the future. Drawings can also be on most types of dot matrix printers. Those offering NLQ printing modes or which have 24-wire print heads will provide finer resolution.

CAD-89 stretches the original 64K RAM limit to more than 300K, which places it on par with some programs currently available on a PC. The program is written in highly optimized 8080/Z80 assembly language. As such, it will outperform graphics editors using high level languages. The CAD-89 program source code is more than 21,000 lines in length, and took two years to develop. The program will use up to 192K of

continued on page 152

SigmaSoft's CAD continued from page 151

IGC memory for drawing list information, plus another 64K to store the high resolution image. If the drawing requires more than 64K, the program will steal all available memory from the computer's own 64K.

In addition to being able to use a standard optical mouse, a trackball input device can be used. Most standard upgrades that boost the '89s speed from 2-MHz to 4-MHz will work, and are recommended to improve the performance of the program.

You might ask, why bother creating a CAD system for an outmoded 8-bit computer. There are several good reasons. The H-89 is a durable machine, and there are a lot of them out there. Some HUG users I correspond with around the country won't give them up, even though they're surrounded by PCs like General Custer was by the Sioux. As a word processing station it is first rate. My 2-MHz 89 is still faster than my 8-MHz PCs in this respect.

It still remains a great hobby machine for people who like to tinker and learn in a way that is deprived the average users of the new high-tech engines. I'm kind of pleased that SigmaSoft has stuck to their promise to provide new and interesting applications for the '89. In doing so, it proves they're also making money in the process, which translates into more interesting products in the future.

CAD-89 comes with a 100-page manual that describes all of the features and editing functions of the program. One almost wishes that it were four times as long, because Darron J. Shaffer, the program's author, and Clay Montgomery, the designer of the IGC, have pooled their talents and produced a very polished and professional product.

When you begin to read the documentation, you are overwhelmed with detail after detail on all the editing modes. So users are advised to just load the program and draw. This is not the type of program where you can absorb the minute points overnight. You will have to apply yourself, but the results are worth it.

All SigmaSoft CP/M software follows the HDOS conventions of accessing all I/O devices in the form of a device driver, rather than incorporating the I/O device into the BIOS. They use a LOADD utility that attaches the device to the BIOS whenever it is called up. This allows H-89 owners who may have non-standard Heath BIOSes (such as those from Magnolia and C.D.R.) to use SigmaSoft hardware and software without the need to alter the CP/M BIOS. It also avoids conflict with hardware that may have required a previous BIOS modification. This can become a tacky situation, as you know.

When CAD-89 is loaded, the screen's 25th line becomes the status command line for editing functions. You can almost dispense with the manual for your opening moves. Using the optical mouse (available from SigmaSoft) is recommended, because it acts like a pen. You can sit back, put your feet on the desk and roll the mouse across the drawing tablet in your lap. During the initial learning period, you can doodle your way across the screen, venting your anger in mischievous ways.

But to use CAD-89 in a practical and productive manner, you will have to apply some skills to build a reference library of working modules. For example, if you are going to produce circuit board designs or schematics, you will have to create your tools which will be stored in a symbol LIBRARY that you can call up and enter on the screen when you need it. Without too much effort you can draw your symbol for resitors, capacitors, AND-OR/NAND-NOR logic gates, transistors, etc. For architectural floor plans, you can create a library file of office or home furniture that can be positioned on screen and moved around at will. You can even experiment with creating a track layout for that train set you bought for your kids but never got around to setting up.

You can design a variety of alphabets and interesting letters to enhance a report, or draw graphs and charts with ease. The program contains more than 50 different paint styles that can fill any enclosed area. If a mistake was made in any area of your drawing, you can erase that section and draw it in correctly. As I mentioned earlier, any spot erasure does not cause the entire screen to be redrawn as with some CAD programs. This saves valuable time, because a complicated drawing might take several minutes to reassemble itself.

While the original IGC software provided 640x480 pixel resolution in interlaced mode, CAD-89 has extended that to 640x768 in non-interlaced terlaced mode, which eliminates much of the ragged edging you encounter when drawing circles or other rounded objects, and diagonals. Interlaced mode will require a special ROM, because the enhanced Watzman ROM from the National Heath/Zenith User's Group will not support interlaced mode. The Super19 ROM and the Ultra ROM, which have been around for a few years do support this feature, as does the new SigmaSoft ROM.

The drawing area in standard mode is three vertical screens. In interlaced mode that is doubled. An associate of mine who has been using Zenith's thousand-dollar AUTOCAD with his Z-100 and PC compatibles, told me CAD-89 is almost as good when he came over to check it out.

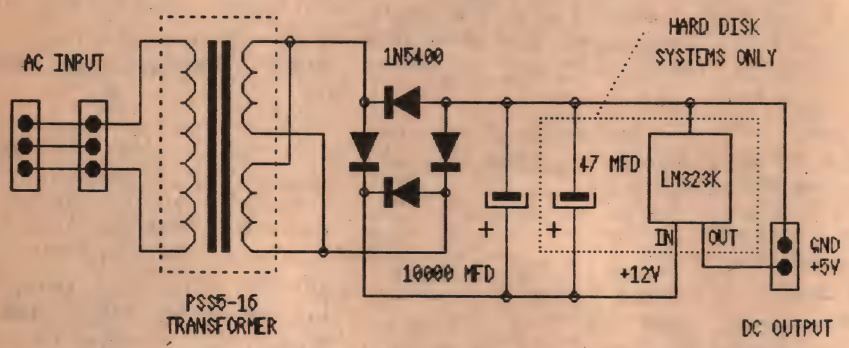
I only had access to the CP/M version of the CAD-89 software because the HDOS version was still in BETA test. However, as SigmaSoft has always used the same command structures for both operating systems, it is very easy to switch from one to the other.

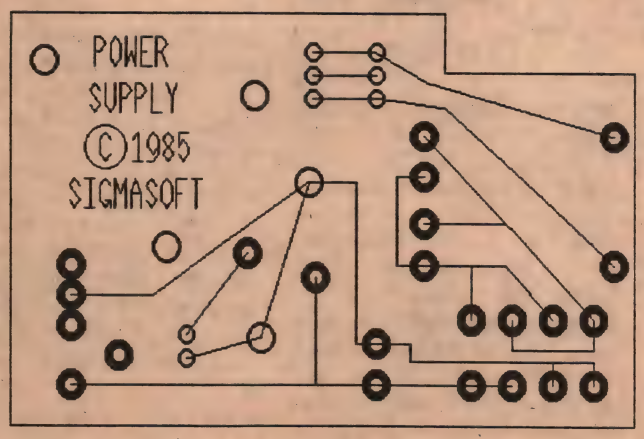
The current price of the SigmaSoft IGC graphics board with 256K RAM and the UPI, plus lots of support software is $395. The CAD-89 software is $175. The optical mouse with drawing pad and technical manual is $145.

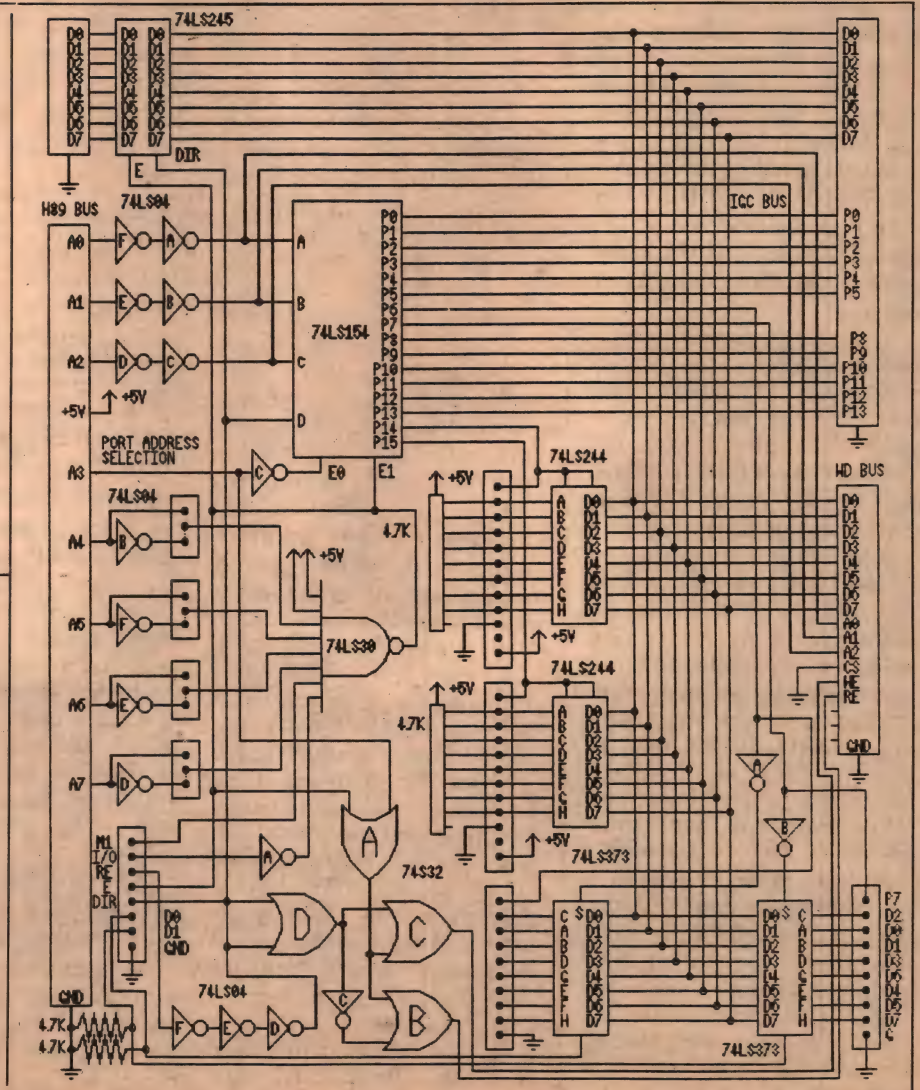
If you already have the IGC, buy CAD-89 immediately. If you have neither, but want to turn your H-89 into a power professional workhorse for more than just your word processing or other basic functions, order the whole package. This is an imaginative system produced by some hot young talent that we will hear from again and again.

For additional information, please contact: SigmaSoft & Systems, 17000 Dallas Parkway, #207, Dallas, TX 75248; (214) 380-6168. ●

Linear Power supply Schematic and Circuit Board Layout







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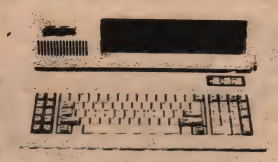

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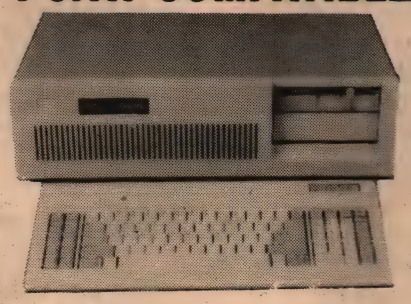

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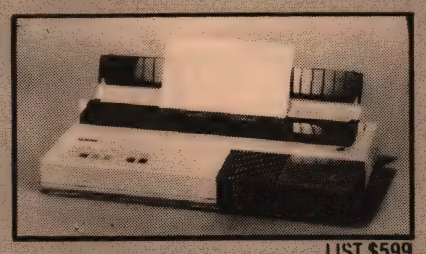

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Spotlight On Business

The Legal Profession A Fertile Ground For Computers

by Barbara E. McMullen & John F. McMullen

Very few professions have provided as fertile a ground for a microcomputer explosion as the legal one. From even a cursory glance, the reason for this should be apparent. The most important commodity in the practice of law is INFORMATION—information relating to previous cases that must be researched as a guide to current cases; information that must be reduced to contract form for clients involved in a myriad of activities (home purchases, business mergers, divorces, employment contracts, etc., etc.); information that must be presented in acceptable legal format for motions, pleadings, summons, supeonas, depositions, etc.—in short, all of the various legal forms and documents required in our legal system. This acquisition, editing, management and creation of information are tasks that computers are obviously well suited for.

Add to the basic requirement of controlling information the necessity of running a business office with the need for maintaining professional schedules (including stringent time accounting for billing purposes) and standard business accounting and the value of computer support becomes even more evident.

Finally, special services provided by attorneys to clients often benefit greatly from computer support. These activities include tax planning, administration of estates, trusts, escrow funds, properties and any other responsibilities unique to individual attorney specialties and/or unique client requirements.

Unfortunately, with the notable exception of some innovative small practioners, much of the progress in the use of technology has been primarily at the large law firm level. The concentration of effort at the large firm was due primarily to the fact that the large firm had sufficient resources to assign interested members to technological planning groups which could then gather sufficient information to guide the firm in its entry into automation. At the same time, the small practioners were, in the words of David Weinberg, editorial director of the American Bar Association, "too busy practicing law to attend to introducing new tools into their practices." Hence, automation seemed to be widening the gap between the level of service that could be provided by large and small firms.

There has, however, recently been a change in this direction. Due largely to both the active lead of the American Bar Association and the entry into the profession of more and more young lawyers who have been exposed to electronic aids in law schools, there has been a major impact of technology right across the board in the legal profession. The expanded role of the ABA is directly tied to the ascent of Thomas Gosner to the position of Executive Director of the ABA approximately three years ago. With an extensive background in the use of computer technology in corporate law, Mr. Gosner brought to the ABA an understanding of the need to make technology available across the entire legal community. He, therefore, made technological services and education a priority item for the ABA and there has been concentration within the organization in meeting this directive.

One of the ABA services that has already made an impact is "ABANET," an electronic communications and on-line information system directed by the ABA and operated by DialCom. Accessible through the Telenet and Tymnet networks and presently utilized by approximately 10,000 users, ABANET contains a myriad of diverse services including:

1. Electronic Mail—The most heavily used service in the system, electronic mail provides the ability to transmit drafts of legal documents for review and editing between attorney and attorney, attorney and client and, in some jurisdictions, attorney and court. Use of electronic mail in this fashion dramatically decreases the necessity of retyping documents in the editing process.

2. Automatic Legal Forms—This service maintains a set of generic legal forms (separated into 8 categories for ease of selection) which may be "downloaded" into the user's computer, modified (if necessary) and filled with the appropriate data.

3. "Westlaw" Access—ABANET users may access the vast case files of Westlaw (announced 2/87).

4. "LAWMUG"—ABANET provides on-line access for members of the "Lawyer's Microcomputer User's Group." The members of this group exchange information, answer questions and discuss items of interest relating to the use of computers in the profession.

5. "ExpertNet" is a directory of medical professionals (with their particular expertise) that are available to be considered as expert witnesses.

6. US Supreme Court Case Reviews

7. Reviews of the "LTAC"—The ABA has formed a group, The "Legal Technology Advisory Council," to review legal-related software and its reviews are available on-line through ABANET. To date, LTAC has concentrated on evaluating "Time & Billing" systems for law offices; in the near future, software relating to other areas will be evaluated. (For further information concerning LTAC which also publishes its reviews, contact Richard Robbins or Michael Bennett at American Bar Center, 750 North Lake Shore Drive, Chicago, IL 60611 (312) 988-5555.).

8. "ABINORM"—provides access to business and management libraries.

9. "AMBAR"—provides access to programs, publications and other materials of the ABA.

10. "EPUB"—provides access to a customized publishing service.

11. News Retrieval Service

12. News Clipping Service—the user provides the subject or keyword in which there is an interest and the service retrieves information relating to the subject.

13. Other services—ABANET also provides access to the "OAG" (Overseas Airline Guide) for travel information, the files of the Bureau of National Affairs and allows access into the Telex Network for communication with users of that service.

(Further information on ABANET may be obtained by contacting DialCom ((800) 435-7342) or by writing David Weinberg, editorial director, American Bar Center, 750 North Lake Shore Drive, Chicago, IL 60611.)

The activities of the American Bar Association concerning computers is not limited to ABANET; other programs have been developed to aid attorneys to determine the proper technological tools for their needs. One of the most exciting of these projects is the "Law Office Of The Future" under which the ABA is developing a prototype of a state of the art computerized legal office. (Information concerning this project is available from David Hamburger at ABA headquarters. (Address above)

An observer who has kept a very close watch on the ABA's efforts is Robert L. Davidson, an attorney in Princeton, NJ. Mr. Davidson spent 20 years working with McGraw-Hill as a technical writer prior to becoming an attorney and his background in writing and working with large databases have convinced him of the importance of technological aids in his new profession. "The attorney or law office not using up to date computer hardware and software will be penalizing not only itself but its clients. The law office that does not keep itself up to date may not survive over the next decade." Although Mr. Davidson is obviously committed to automation wherever possible in the law office, he recognizes the difficulty faced by the smaller firms in computerizing. He applauds the support provided by the ABA and also recommends a publication that he formerly edited, the *Attorney's Computer Report* (published by Professional Publications, Inc., PO Box 80280, Atlanta GA 30366 as a good source for those wishing to increase their knowledge of computers in the profession. Additionally, Mr. Davidson is hard at work on a directory of persons and firms who provide products and services of value to attorneys and law firms. The directory will be published by Prentice Hall/Simon & Schuster in January 1988 and it appears that the directory will contain over 4,000 separate names.

Another person who has been engaged in developing an aid to attorneys in determining the proper technological tools for their particular needs is John Edwards, co-author of *The Law Office Guide To Small Computers*, published by Shepard's / McGraw-Hill in 1984. This impressive work, priced at $75.00, is unfortunately not sold in bookstores and is only available from Shepard's (PO Box 1235, Colorado Springs, CO 80901 (303) 577-7707). Purchase of the book entitles the buyer to annual updates that are automatically sent to holders of record on an annual basis. We found this work to be particularly useful for the person about to automate a small practice but feel that the book is a good reference point for all size entities. (The description of the LTAC in the 1986 supplement was extremely complete and information like this is invaluable.) Although Edwards is not an attorney (his co-author, Forrest Dean Rhodes is an attorney, formerly with the Department of Justice), he has come to have a clear understanding of the problems that attorneys face in computerization and feels strongly that they cannot allow the difficulties to dissuade them from introducing computers into the law office—"We must be careful or the technology that is supposed to allow the small firm to provide more services will instead widen the gap between the large firm and the small one."

Similar thoughts are shared by Daniel Bernstein, partner at Reid & Priest, a 130 lawyer firm based in New York, "The legal profession has become increasingly competitive and computer technology provides an important role in delivering quality service rapidly. We rely heavily on computers for word processing, legal research and accounting functions. It seems to me that the importance of computer support has put more of a strain on the medium size firm than others. These firms often have a number of attorneys but lack the capitalization to provide the support tools that the larger firms can afford. While this is not the only reason for the seeming acceleration of mergers among smaller firms, it is certainly a contributing factor." Stephen Fearon, partner at New York's Condon & Forsyth agrees and points out that sophisticated

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Spotlight on Business continued from page 155

technology in the word processing area allows "larger firms to innodate small firms with paper. They can just grind out paper and, at times, overwhelm the sole practioner or small firm."

Donald David, partner at New York City's Dreyer and Traub, disagrees with the prevailing wisdom that lack of capital prohibits individual practioners and small firms from automating—"The task of automating a legal office or, for that matter, any office requires three things: the capital necessary to purchase equipment, capital to obtain the necessary software and pay for any on-line service use and the time necessary to become familiar enough with the technology to both make appropriate purchasing decisions and to effectively use the tools, when purchased. While it may have once been true that the cost of equipment was prohibitive to the small practioner, it is certainly no longer the case. The advent of the name brand IBM PC clones has had a tremendous impact on price. I can probably configure a Tandy 1000 with a modem to take advantage of the on-line services for under $1,500.00 and, when you amortize that over a few years, the benefit available in word processing, time management and research is well worth the price. Similarly, the software is affordable. A wonderful billing and time management program, "TimeSlip," costs $99.00 (JuriSoft, Inc., (800) 262-5656) and is certainly sufficient to control the billings of a small office. Even the best word processing programs cost no more than a few hundred dollars."

David continues, "When you look at legal research, the cost benefits seem to break down. True legal research is usually unjustifiably expensive for the small practioner who will generally not recoup expenses until the end of a case and, in the case of neglience cases, will be operating on a contingency basis. BUT the average small practioner is not usually engaged in true legal research. It is factual research that is normally required and that is available from CompuServe and Dialog at reasonable prices. It is this type of service that narrows the gulf between large and small firms. The individual practioner that doesn't have the resources to spend 1/4 of a million dollars a year on a law library like my firm's can reap the benefit of such a library should he need it. Similarly, he may not be able to afford $300.00 per day for an expert consultant on a particular subject but he can, for a fraction of the cost, read everything the experts have published on the subject."

David concludes, "The real problem is the third item—determining the appropriate equipment and software for the task. Most individual practioners lack both the time and the capacity to do this work. The chances are that mistakes will be made in the selection of the items and that there will be a high degree of frustration and less than full return on investment. If the ABA services can reduce this problem, they will be performing a valuable service."

One of the areas that Condon & Forsyth, Dreyer and Traub, Reid & Priest and most other firms have come to depend on computer support is legal research. Computer interface to Mead Data Central's "Lexis" system or West Publishing Company's "WestLaw" system provide the basis for most legal research now performed by law firms. Lexis ((800) 227-4908 for information) contains the following:

1. "Lexis Library"—a library of statutes and regulations including full text coverage of federal cases and case law of all 50 states, the U.K. and France. The library also contains specialized law libraries for admiralty, banking, bankruptcy, blue sky, communications, Delaware corporations law, energy, environmental, insurance, international trade, labor, military justice, patent, securities, public contracts, tax, trademark & copyright, trade regulation and transportation.

2. "Lexpat"—contains the full text of every patent issued since 1975.

3. American Bar Association Material—this section provides full-text coverage of The Code of Professional Responsibility and Judicial Conduct, opinions of the Commission on Ethics and Professional Responsibility and the Constitution and Bylaws of the House of Delegates of the ABA.

4. "Auto-Cite"—Verifies case law citations by providing, name, date, legal histories, parallel citations and titles of ALD and L.Ed. annotations.

5. Shepherd's Citations—This service, produced by Shepherd's/McGraw-Hill, contains citations to all federal, state and regional case law and includes case history, parallel citations and a statement of the subsequent history of the case.

Lexis' primary competition in the legal research area, Westlaw, offers a wide range of information including its own extensive case libraries (containing such categories as Federal Cases and Regulatory Decisions, State Law, Admiralty, Military Justice and Attorney General opinions), Shepherd's Citations, Black's Law Dictionary, "Eurolex" (the full-text legal research service maintained by England's European Law Center, Ltd., which contains libraries covering U.K., European and Common Market Law) and Forensic Services Directory. As mentioned earlier, Westlaw services have recently been added to ABANET.

In addition to Lexis and Westlaw, there are many on-line database services that may be of interest to legal professionals. Dow Jones contains a wealth of financial data (including market quotations, historical quotes, public disclosure information, earnings estimates, financial news) while "Nexis," another service of Mead Data Central, provides on-line access to newspaper and wire services, Encyclopedia Britannica, "AICPA" (American Institute of Certified Public Accountants) material, Forensic Services Directory and other information. There are medical databases, insurance and actuarial database, agricultural databases, scientific databases, econometric databases—in short, available data for any type of research required. *Inc. Magazine's Databasics—Your Guide To Online Business Information* by Doran Howitt and Marvin I. Weinberger (Garland Publishing, 1984, $16.95) contains a comprehensive overview of available databases. Additionally, the aforementioned *Law Office Guide To Small Computers* gives a detailed description of the contents (including beginning dates) of "Lexis" & "Nexis," "Westlaw," "Juris" (the full-text service developed by the US Department of Justice) and that portion of "Dialog" (the most comprehensive of all commercial databases, owned by Lockheed) considered relevant to attorneys.

The most significant product of any legal office is paper—contracts, affidavits, interogotories, depositions, wills, agreements, etc., etc.,—and while the on-line services have aided in the preparation of the final product by providing both material for the various documents and a means of delivery, there still remains the massive task of preparing all of the necessary text for the final product. It is in this area, word processing, that technology has had a tremendous impact on legal offices.

Prior to the microcomputer explosion, the larger law firms installed dedicated word processors (such as the IBM DisplayWriter, Wang Wangwriter, Alliance, OIS 40 & 50 word processors and the CPT 8000, 8100 & 8500 series word processors) while smaller firms continued to type, edit, cut & paste and retype—and retype and retype. The advent of the microcomputer made the benefits of computer-based word processing available to even the smallest firm. As more and more firms began to use microcomputers for word processing, products that attempted to emulate the dedicated word processor (ex. "Multimate" is extremely "Wanglike" and "DisplayWrite" moves the DisplayWriter environment to the PC) became extremely in law offices that had those systems already installed. In other offices, "WordPerfect" and Microsoft "Word" (Dreyer and Traub's choice) became the products of choice while "Framework" attracted some because of its outline capabilities.

Once a word processor was chosen, it generally becomes difficult for a person to easily change to another system. Partly because of familiarity and "comfortableness" with the system and partly because of an appreciation of the difficulties that occur when it is attempted to either run two systems simultaneously or to covert all the data files from the old system, there will be an inertia that will keep the person plugging along with "WordStar" or "AppleWriter" even though they realize that the Thesaurus contained in "Word" might be helpful. An advocate of the "If it's not broken, don't fix it school" is Chicago area-based individual practioner Barry Bayer, one of the early users of microcomputers in the legal profession. Bayer, a long-time writer on the use of computers in business in general and the law in particular, uses AppleWriter II on an Apple IIe as his primary word processor (he also uses software running on a Compaq and an Apple Macintosh for other aspects of his business and is a Westlaw user so his continuance with AppleWriter is certainly not a case of his being out of touch with developments in technology) "An essential consideration with technology is to use it to enhance the activities of the practice and not to allow disruption without a significant reason. "AppleWriter" has served my needs well and, at the present, there is no compelling reason to move to another computer or word processor. It is important to maintain a businesslike approach to technology—any change must have a resultant benefit that justifies the expenditure of time and money necessary for its implementation."

One attorney who feels that he has found the ultimate word processing software for his practice and perhaps for all attorneys is Joseph Root, an associate at Keynon & Keynon, a New York based firm specializing in patent law. The object of his affection is "Nota Bene," the product from Dragonfly Software (409 Fulton Street, Suite 202, Brooklyn, NY 11201, (718) 624-0127) that combines a powerful word processor and a free text filing and search system. Aimed at lawyers and academics, the system has the ability to maintain notes, references and boiler plate material in an index card format and integrate them into the finished document as required. It also maintains strict control over bibliographic formats and, if desired, imposes the American Legal Citation method on the writer. Root is particularly impressed with the cross referencing capabilities of the system, "In preparing documents of the complexity of ours, it is often easy to get lost in the numbering of references. The control that Nota Bene, with its automatic renumbering capabilities, provides removes the difficulty." Additionally, Root finds the ability to "program" within the system to be quite useful, "I've been able to develop a system for the production of the formal filing papers that must accompany a patent application. A menu asks the user such questions as 'how many inventors' and properly sets up the document to reflect the answer. Although programming is certainly not required to use the system—it has a 'Lotus-like' user interface, it's an additional benefit to have that capability."

The use of word processing as a standard within the legal community has both improved the quality of output and has allowed for more rapid delivery of service to clients. Fearon points out that his firm, Condon & Forsyth, has been able to send diskettes to firms that they have been working with in other states for the firms to edit to meet requirements of the local jurisdictions. Root mentions that there has been a rumor of electronic filing with the Patent and Trademark Office. The ABA's Weinberg stresses the use of ABANET's electronic mail for the transmission of documents. None of this would have been possible were it not for the proliferation of word processing throughout the legal community.

After word processing, the next most utilized program in legal offices are those which control attorney's time spent and set up the appropriate client billing. In addition to "TimeSlip," mentioned earlier by Donald David, there are an abundance of programs that

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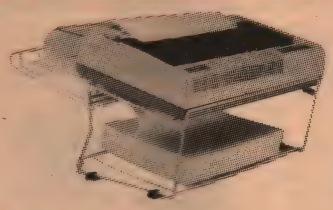

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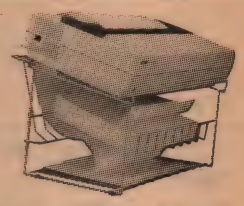

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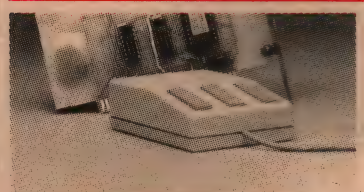

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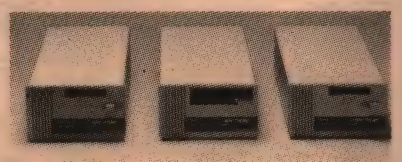

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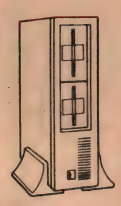

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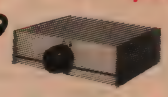

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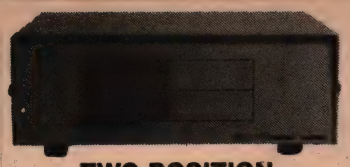

TWO POSITION

#38610 .....RS232 Type **$28.95**
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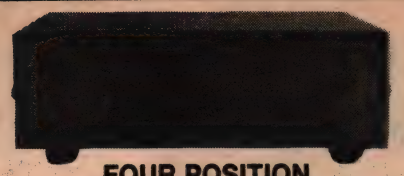

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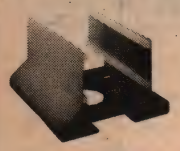

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- Flip Top Filing System with Snap-Close Latch
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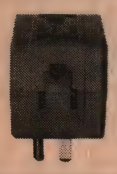

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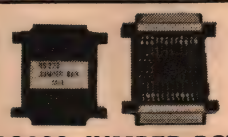

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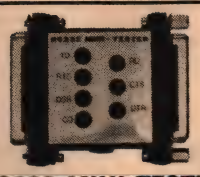

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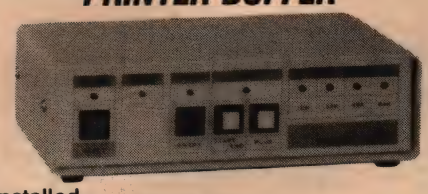

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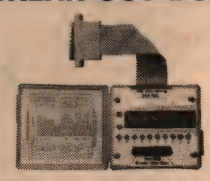

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MISCELLANEOUS

Sony And The Multiscan Gang: Monitors For The Future

Reviewed by Wayne A. Yacco

The NEC Multisync, recently reviewed by one of *Computer Shopper's* contributors (see: "Too Much AUTOmation?" January 1987), was a landmark achievement in flexibility, protection from technological obsolescence and price/performance ratio. For many of us there was no longer a choice if one wanted the ultimate color display for business applications. Now, there are plenty of choices and some of the competitors are already making the Multisync look somewhat dated.

Since that NEC review was written last October, several other manufacturers have brought similar displays to market. Last year's Fall Comdex provided a hundred thousand, or so, of us with an opportunity to see a few of them. But not many have had a chance to actually use one of them because they have been in short supply. For this review, four of the new entries were placed side by side for comparison: the Sony Multiscan CPD-1302, Taxan's Super Vision 770, the Teknika MJ503, and Thomson's Ultra Scan 4375M.

These multiple-signal, 13" monitors all share one basic set of features. Each offers the ability to display a wide variety of video signals, including both digital (TTL) and analog signals, across a wide bandwidth. This gives the monitor a spectrum of color and resolution that depends on the video controller board, and the software drivers available to the user, rather than limitations of the monitor.

Multiscan and Multisync are terms derived from the capacity of a monitor to detect synchronization signals and automatically adjust its internal reference signal to the corresponding frequency. One does the same thing, manually, on a television set when it is necessary to adjust a picture that is rolling or distorted. On a Multiscan-type monitor this function is performed by logic-seeking circuitry.

It is the wide range of horizontal frequencies that give these monitors most of their versatility because horizontal frequency has the greatest impact on resolution for most current video standards. With digital technology it is resolution that is usually increased to provide an improved display.

Increasing resolution is one way that picture quality can be improved. Enhancing the nuances of color and intensity is another method that also impacts the perceived quality of displays. Common TTL RGB monitors offer one of these alternatives—resolution—Multiscan- type monitors offer both.

Analog circuits allow a virtually infinite range of colors to be displayed. The IBM Professional Graphics Controller (PGC) is among the analog-video standards that all of these monitors can accommodate. One, the Thomson, can also display the NTSC and PAL signals used in broadcast television.

Specifications for the four monitors are compiled and presented in Figure 1 (on page 316) for easy comparison. Test results for and special features of, each monitor are discussed below.

Test Conditions

Tests for the monitors were

continued on page 160

X Window: Promising Windowing Standard

A host of computer manufacturers have announced commitment a coactive support for the X Window system as a public windowing standard for the graphical computing environment. X Window was developed at MIT by Project Athena and the Laboratory for Computer Science. Project Athena is the MIT-initiated exploration of the use of high-performance computer workstations in its curriculum. A windowing system allows a screen to display multiple applications at the same time. The X Window system extends this capability to a networked environment.

The companies—Adobe Systems, Apollo Computer, Applix, Dana, Data General, DEC, Hewlett-Packard, MassComp, Siemens, Sony, and Stellar—agreed to accept X Window as a standard for the display of graphic information in a networked environment. The computer manufacturers will promote X Window as an industry standard for the display of graphic information in a networked environment, and urge all interested parties to participate in its specification and refinement. They will cooperate with others to further develop and enhance X Window; encourage formal standards bodies to adopt X Window as a global industry standard; and incorporate X window in new products.

The companies also announced a cooperative effort to extend X Window to include a set of high-level user tools on top of the standard to allow application developers to easily create user environents and interfaces. A proposed specification for such a set of tools has been submitted to MIT and is available for public review and comment.

Computer industry executives joined MIT in making the announcement at a press conference to emphasize the importance of establishing a worldwide, publicly held base windowing standard that serves everyone, and offers a stable foundation for ongoing development.

The press conference was held in conjunction with a Project Athena-sponsored User's Conference on the X Window System at MIT.

"One of the goals of the User's Conference is to establish the process for X Wondow's future development and enhancement," said Steven R. Lerman, MIT professor and director of Project Athena. "It is MIT's intention to continue the design and development of X Window as an open architecture involving both universities and the computer industry."

There is consensus in the computer industry that standards are essential. Agreement on a formal windowing standard and cooperation in its specification eliminate much of the frustration and confusion inherent in multiple, proprietary standards. This enables companies to provide a more efficient and productive computer environment.

A publicly held standard assures equal access to source code and allows all parties to participate in its evolution and to contribute to its enrichment. X Window meets these criteria, since MIT imposes no licensing restriction, and encourages both academic and commercial contributions to the code.

Since networks typically consist of diverse hardware, a windowing system must satisfy several criteria to assure that applications can work seamlessly across diverse machine architectures. X Window features proven effectiveness —it has been under development at MIT since 1984. It has undergone rigorous evaluation and extensive refinement through the individual and cooperative efforts of numerous universities and manufacturers. During this process, X Window has been very broadly applied, tested and validated with very positive results. Existing applications have been ported to several machine architectures that cover a number of manufacturers and display architectures. Implementations of X Window are already available commercially.

X Window is a "public resource"—it is non-proprietary, open, and publicly available. MIT furnishes complete X Window sources for the cost of media, without any license restrictions or fees. All interested parties are encouraged to contribute code without any restriction. This allows broad access and industry-wide participation in the evolution and enrichment of X Window.

X Window is transparent and portable—from the beginning, two objectives of X Window were to make it transparent across a multi-vendor network, and transportable for applications software. X Window is a network-transparent, portable window system, which allows applications to work seamlessly across various machine architectures and networks.

It is specifically designed to support diverse hardware and provide machine-independent interfaces. There is no contemporary network-transparent windowing system that has been so thoroughly exercised and evaluated. Network transparency means the user is able to intract with many applications, pulled in from a variety of machines, whose outputs are concurrently displayed in separate windows. This provides the user with a very high degree of flexibility and increased productivity.

Transportability is a major benefit to the software developer since applications do not have to be rewritten for every display. The graphic output on an application run on any machine in the network can be viewed as a window on any display in a device-independent, network-transparent fashion.

X Window is feature-rich. It provides a comprehensive set of capabilities to allow easy creation and manipulation of tailorable user interfaces and graphical characteristics. For example: output to display; management of resources (screen, fonts, objects); and management of input devices. It is independent of both hardware and operating system. Servers and clients communicate via a well-defined protocol, which is independent of the characteristics of the computer's hardware and operating system.

X Window may be readily extended as well. There is an organized and systematic method for making extensions and adding to the client/server protocol. The extension mechanism allows communities to extend the system independently, yet assures that such extensions can be gracefully merged. The extensibility of X Window facilitates the support of many applications, such as page and document description languages, and graphics libraries, such as PHIGS (Programmer's Hierarchical Interactive Graphics system). This assures that the system is adaptable to current and future hardware.

X Window satisfies the requirements for a practical standard in an environment of workstations and mainframes, connected via high-performance, local area networks. It provides a core protocol that can serve as a standard for window construction. The announced commitment and support of X Window marks a rare event—the cooperation of a large number of diverse companies to initiate an industry standard. ●

Cheapsquawk: Low-Cost Sound For Surplus "Mute" Monitors

by George N. Ewing

For many home computer applications, one of the biggest bargains around these days is to be had in excellent quality surplus monochrome monitors. They are widely available for prices from fifty dollars or so to as little as twenty, or even less, if the user is willing to provide a second-hand or homemade cabinet, or sometimes, a DC power supply or an AC transformer for the monitor's own internal supply. These monitors are usually simple and fairly straightforward to hook up, and often provide a much higher resolution than a TV set for applications such as word processing and CAD sketch programs. Software-generated 80-column text on a Commodore C-64, for example, is clean and legible on a 900 or 1,000 lines-per-inch monitor, but may be almost impossible to read on a color TV set. One disadvantage, though, is that many of these surplus monitors were originally designed to be used to display text at places like airports, where sound wasn't needed, or with computers that already had their own internal sound amplifier and speaker, so there is no provision for sound at all.

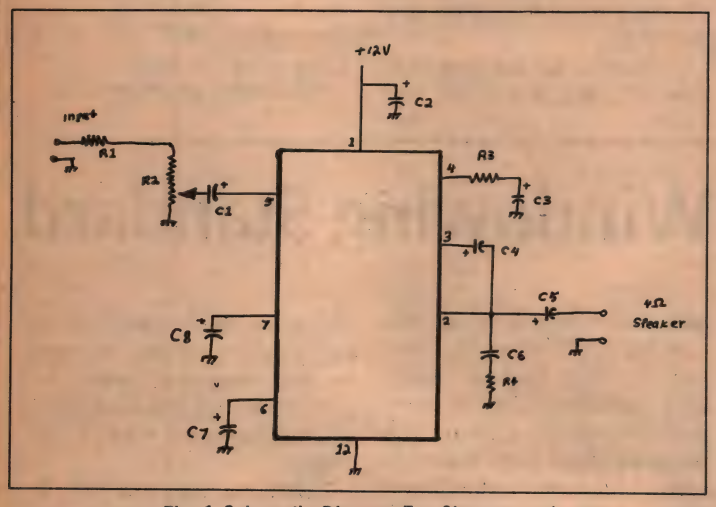


Fig. 1 Schematic Diagram For Cheapsquawk

I recently acquired a second-hand C-64 system, and while it worked fine, I was not terribly happy with the resolution when trying to read text on a 19" color TV. I ordered an inexpensive monochrome composite monitor from one of the big liquidator firms advertising in the *Computer Shopper*. When I phoned in the order, the company carefully warned me that there was no sound channel or speaker. As my primary interest was word processing, I didn't worry about it.

The monitor, which cost $49 plus shipping, arrived in about two weeks. It was a brand new C.T.I. model, and was very nice indeed, with an amber polarizing glare filter. It was apparently designed to be sold as a companion monitor with the "Eve" brand of Apple II—clone personal computers. It was intended for office or classroom use in fairly large quantities; the 75-ohm coaxial video inputs were designed to be "daisy-chained" one to the next, so a number of students could view the same program display at once, and the AC power consumption had been carefully kept to only 30 watts. The FCC type-acceptance was for industrial or school use only, though I have had no RFI problems with it in a noisier-than-average home rf environment. Another big bonus: it came with a schematic diagram you could read without a magnifying glass!

There was a blank space inside the back panel for an optional 5-watt audio module, and an empty knockout for a connector, but no electronics inside, nor any provision for a speaker. At first, I didn't miss the sound channel when running the C-64, though some W/P software does use audio cues and alarms, but last Christmas, Santa brought a number of games, and even a couple of public domain music programs. I still didn't miss the "Bleegle-queep" arcade-type sound effects, but a couple of the games included synthesized verbal instructions or passwords, and of course, the music programs were pretty useless without a speaker; watching a cartoon Scott Joplin figure whanging away in ragtime at a totally silent piano grows boring after a while, no matter how good the animation on the screen!

Of course, it was always possible to use an external audio amplifier with the C-64, or a set of headphones. An old portable TV set could also be fed with rf on channel 4, and then used just for audio. I decided to avoid the makeshift approach though, and to add a simple sound system to the monitor I was already using; there was plenty of room, and for a modest watt or two, the power supply ought to have plenty of capacity.

My first choice for a sound chip was the venerable LM-380, with which I was already familiar. It was quite cheap, (usually less than a dollar) ran off 12 volts, and the newer "N" versions could handle a couple of watts if you soldered a bit of copper to the ground pins on the DIP package to act as an external heat sink. I rushed down to a local Radio Shack to get one, and made a very disappointing discovery: Although recent copies of the Archer semiconductor catalog still listed it, (RS Part #276-706) the LM-380N had been withdrawn from inventory, and was no longer stocked! A number of mail order suppliers still listed it, and for prices as low as 79 cents, but most of them had a minimum order and shipping and handling charges that made sending away for just one or two chips uneconomical.

The Radio Shack store did have a promising substitute, though. The BA-5406 (RS Part #276-707) was a dual channel, 5 watt stereo audio amp designed for automotive sound systems. It listed for $2.69, but was currently on sale for $1.55. The 5406 is a 12-pin single-inline package with a big, flat thermal area for a bolt-on external heat sink, (up to 20 watts dissipation at 75° C) and was designed to run at a wide range of supply voltages from +5V to +15V DC. I was only going to use one channel, and I wouldn't need a full 5 watts, but if the chip was rated for that, it should run as an exceptionally clean, quiet, and stable amplifier at a watt or two.

Almost any similar small audio amplifier should do as well, providing it will run on the power supply available in your monitor. Other good candidates would be the Signetics TDA-1015/1020 series chips, which also come in an upright single-inline package, or the LM-388-3, which is a 14-pin DIP package. If your monitor runs off a higher DC supply voltage, such as 18 or 24 volts, you might want to consider the LM-383, (Radio Shack part #276-703) which is an 8-watt single channel amplifier in a TO-220 tab-top package. In any case, be sure you can get a data sheet for the chip you use, or that you can find it in an IC data book.

For a speaker, I chose a 3", 2 watt, CB radio replacement speaker, which listed for $2.19.

Sony Multiscan continued from page 159

conducted using an IBM PC AT and an Eagle Spirit portable. To eliminate even the slightest equipment bias, the monitors were all connected to both machines for pair-wise evaluations. There were no apparent differences due to the two systems.

Each machine was equipped with an identical Paradise Auto Switch adapter. This adapter automatically switches between color modes and also has manual switch settings for output to a monochrome monitor.

By choosing monochrome output, it is possible to drive some Multiscan-type monitors with this card's Hercules-compatible graphics capabilities. It is possible to display a normal MDA signal through the emulation provided by the EGA standard but only on a color monitor. Hercules is not supported by the EGA standard and the NEC Multisync lacks monochrome capability because the lower limit of its vertical range is above the 50 Hz required for that monochrome-graphics standard.

Teknika MJ 503

This monitor offers features similar to the NEC. It, like the Multisync, does not automatically adjust for vertical synchronization except between preset standards. In addition, the Teknika has two discontinuities between the three preset steps, or ranges, that it offers. These steps are 15 - 17 KHz, 21 - 25 Khz, and 29 - 34 KHz.

Sony CPD-1302 Multiscan Monitor

Tests of the EGA image produced a clear, sharp image with adequate 16-color differentiation. However, that image was crooked on the screen. Either the mask or the CRT itself was twisted counterclockwise a degree or two. This produced a very noticeable taper in the border along all four edges of the screen.

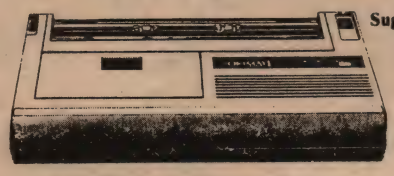
The Teknika has a relatively narrow bandwidth of 23 MHz, compared to about 30 KHz for the others (its horizontal-scanning range is approximately the same at 15 to 34 KHz). While the Teknika provides CGA-, EGA-, and PGC-display compatibility, it does not provide for all alternatives across its frequency range and is, perhaps, somewhat less likely to provide compatibility for forthcoming standards than some other Multiscan-type monitors. This appliance cannot function as a monochrome monitor and failed to display anything for Hercules-type input.

The Teknika was one of two monitors that is likely to require a screwdriver for some of its adjustments. Most of its controls are more reasonably accessible and the most commonly required are provided on the front of the case. Brightness, contrast, and horizontal position are easily adjusted with wheels beneath the front of the monitor. The power-on switch

continued on page 315

continued on page 316

OKIMATE 20 Color Pack $199



Suggested retail: $269

24 PIN HEAD — 256 COLORS

- 80 cps printing • 40 cps letter quality • 8K buffer
- Superscript, subscript, italics and underlining
- Friction and tractor/pin feed paper handling
- High resolution graphics • Color Screen Print Software Package
- Plug 'n Print Kit for Apple IIe, Apple IIc, Amiga, Atari ST, C64/128 and IBM PC/PCjr. With cable, software, paper, and two ribbons.

Optional graphics interface card for IIe.. $69

New Life For Your Old Printer:

NLQ Upgrade and SelecType Feature

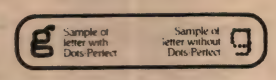
Review: Computer Shopper, page 272, January 1987

Don't replace your printer, upgrade it!

Dots-Perfect $63

Suggested retail: $79.95

an upgrade kit for Epson FX, JX, RX, MX and IBM graphics printers



You also get Graftrax with MX kit.

Dresselhaus COMPUTER PRODUCTS

cordata Complete Package

PC-400 25 ME

IBM PC-compatible
Dual 360KB diskette drives
512KB memory
Keyboard
14 inch tilt swivel monitor
Serial port, parallel port, electronic desk,*
640×400 graphics.
MS DOS GWBASIC

$925

Suggested retail: $1495

Shipping charges: $20 UPS ground

* Lotus *1-2-3* alike, from Alpha Software, list: $319

If You're Serious About Buying A Printer

Try to do the following:
(1) Read Consumer Repts, June 85,
(2) Gather specifications/samples,
(3) Find the best interface/cable,
(4) Shop and compare.

Send $1 if you need information on (2) and (3). Printers and interfaces are our specialties. In fact, we are continually testing and evaluating new printers and interfaces.

Consider our Plug 'n' Print package which includes:
(1) A printer of your choice,
(2) The best interface/cable and
(3) 200 laser perf 20# paper.

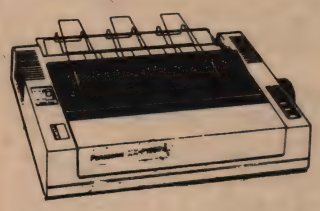
We guarantee our package works beautifully the first time you plug it in and thereafter. NO guesswork, NO fuss. We also customize printer pack to suit your printing needs.

Computer	Interface	CITIZEN 120D	Panasonic KX-P1080i (New)	Star NX-10
Apple II+, IIe, IIc Atari 400, 800 Commodore 64, 128 IBM PCjr. Timex 2068 TI99/4A	Apricorn graphic Xetec Graphix Xetec 8K SGX S-P converter Aerco CP Axiom TI	$259	$289	$305
Amiga, Atari 520/1040, AT&T Compaq, IBM PC, Columbia, Kaypro, Osborne, Tandy, Sanyo	Cable	$209	$239	$255
Print speed (cps): draft, NLQ		120,25	120,24	120,30
Printer buffer, warranty (month)		4K,12	1K, 24	5K,12

Panasonic

2-year warranty on all printers

New Improved Models:

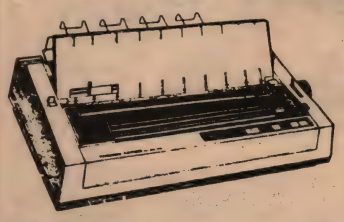


KX-P1091i $279
- Draft/NLQ: 160/32 CPS
- NLQ in Italic, Bold, Double width, Elite
- Print Buffer: 1K
- Friction and push tractor feed
- IBM Graphics and Epson compatible

Suggested retail: $499

KX-P1092i $359
- Draft/NLQ: 240/51 CPS
- NLQ in Italic, Bold, Double width, Elite
- Print Buffer: 7K
- Friction and push tractor feed
- IBM Graphics and Epson compatible
- 5 Switch selectable print modes

Suggested retail: $599



KX-P1592 $445
- Draft/NLQ: 180/38 CPS
- 9 Switch selectable print modes
- Print Buffer: 7K
- Friction and push tractor feed
- IBM graphics and Epson compatible
- 15" carriage

Suggested retail: $699

KX-P1595 $569
- Draft/NLQ: 240/51 CPS
- Print Buffer: 8K
- Friction and push tractor feed
- IBM graphics and Epson compatible
- 15" carriage

Suggested retail: $949

Panasonic

BUSINESS PARTNER FX-600
PC/XT COMPATIBLE
- 8086-2 processor switchable between 4.77 and 7.16 MHz.
- Socket for 8087-2 co-processor.
- 256 K RAM, expandable to 640 K on motherboard.
- Six slots: four for long boards and two for short.
- Standard Parallel port and clock calendar.
- Supplied with MS-DOS 3.1, GWBASIC 3.0, and diagnostics.
- 20 MB hard disk is installable.
- Panasonic Color/Monochrome Graphics Adapter option.

FX-600F1: $799
One half-height 5-1/4" floppy drive (360 K)

FX-600: $939
Two half-height 5-1/4" floppy drives (360 K x 2)

FX-600 HD20: $1295
Single 360 K floppy drive, 20 MB hard disk, controller board

BUSINESS PARTNER 286 FX-800
AT COMPATIBLE
- 80286 (16/24-bit) processor at 6 MHz or 8 MHz (switchable).
- Socket for 80287 co-processor.
- 512 K RAM, expandable to 15 MB (1 MB on motherboard)
- Ten slots: seven for long boards and three for short.
- Standard parallel port and clock calendar.
- Lock prevents unauthorized operation.
- Supplied with MS-DOS 3.1, GWBASIC 3.0, and diagnostics.
- 30 MB hard disk is installable.
- Panasonic Color/Monochrome Graphics Adapter option.

FX-800 F1: $1499
One half-height 5-1/4" floppy drive (1.2 MB with read-only PC standard 360 K capability)

FX-800: $1639
Two half-height 5-1/4" floppy drives (1.2 MB/360 K x 1, 360 K x1)

FX-800 HD30: $2259
Single 1.2 MB floppy drive, 30 MB hard disk, controller board

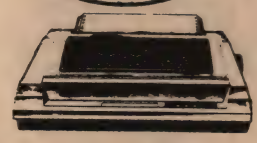
Shipping charges: $15 UPS ground

ACCESSORIES:

- TR-125 M9T Hi-Res Green 12" Monitor IBM Compatible $169
- FZ-BG171 CGA Card for Color or Monochrome Displays $85

Printer Sales

SPECIAL



Epson CR-420 $669
- IBM 5152 GRAPHICS
- 420 CPS (Draft Mode)
- REAR & BOTTOM PAPER ENTRY
- PRINT UP TO 5-PART FORMS
- FRICTION & TRACTOR FEED
- PARALLEL & SERIAL I/F
- BUILT-IN SOUND ENCLOSURE

Epson HomeWriter Pak $269
- Draft/NLQ: 100/16 CPS
- Print buffer: 1K
- With optional tractor and interface cartridge with cable for Apple IIc or IBM PCjr.

Epson FX-286 $509
Draft/NLQ: 200/40 CPS Print Buffer: 8K

Epson LX-86 (New) $249
Draft/NLQ: 120/20 CPS IBM compatible

CITIZEN MSP-20 $319
- Draft/NLQ: 200/50 CPS
- Print Buffer: 8K
- Friction and push feed tractor
- 10" wide carriage

CITIZEN Premiere 35 $469
- Daisywheel: 35 CPS
- Diablo compatible: printwheel, ribbon and commands
- Print Buffer: 8K
- Friction and push feed tractor
- 17" wide carriage
- 12 month warranty

Seikosha SP1000 Pak
- Draft/NLQ: 100/20 CPS
- Print buffer: 1.5K
- Tractor and friction feed

For Commodore 64/128 with cable $179
With optional printer cable ($22 value) $215
For Apple IIc, Amiga, Atari ST, IBM PC and compatible
With printer interface and cable $265
For Apple II+/IIe, Atari 4/800
Specify your computer model.

Star PowerType $199
The perfect daisywheel printer for crisp, clean, executive quality correspondence
·18 CPS
·Dual interface: P/S

Star NP-10 100/20 CPS $179
For IBM PC and compatible

Star NX-10 C 120/30CPS $249
For Commodore 64/128. With cable and new ROM to improve print features.

Printer Enhancements ACCESSORIES

Epson FX Upgrade $115
An Epson product to enhance your FX-80, 80+, 100, 100+ to FX-85/185: NLQ Printing, 8K print buffer and SelecType features. Available in 4 different kits. Give your model.

NLQ for Okidata ML 82A/83A $85
A Rainbow Tech product to enhance your printer to NLQ and SeleType features at the touch of a button. Easy to follow installation instruction is included. Give your model.
You also get dot addressable graphics
- Pica, elite or compressed type styles
- Double width characters in any type style
- Draft (DQ 190CPS) or Near Letter Quality (30 CPS)
- Ability to print all IBM printer symbols
- Ability to print double line box drawing symbols
- Backspace for easy overstriking

NLQ for *Star Gemini* 10X/15X $55
New from EPS Florida.
Give IC# on printer control board: 11D7801G176 or 12D7800G

Buffer and StyleWriter $169
64K buffer (expandable to 128K) and letter quality printing for Epson MX, FX, Okidata and compatible. A dual function box: straight printer buffer and/or letter quality printing. You pay one low price for this double utilities.

Toshiba P321 IBM ROM set $48

Okidata ML92/93 IBM ROM set $65

MicroBuffer Mini $89
128 K, parallel to parallel with cable and power supply. A Practical Peripheral product. 5 years warranty.

Printer Switch $59
2 printers/1 computer or 1 printer/2 computers with cable. Parallel to parallel.

Printer Stand $12

Tractor units

Epson LX-80/-86/HomeWriter	$39
FX-80/85	$48
Okidata ML92/192	$59
Toshiba P321	$85

Cut Sheet Feeders

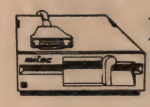
Epson LX-80/HomeWriter	$59
FX-80/85	$85
FX-100+/185/286	$109
CITIZEN Premiere 35	$285
MSP-20	$179
MSP-15	$189

Ribbons (Genuine Manufacturer's)

Panasonic	$9	Star NX-10	$8
Seikosha	$8	Citizen 120D	$6
Okimate 20 Color	$5	Black	$4.50
Epson JX-80 Color			$16
JUKI 5510C Color			$10

Apple Orchard

DISK DRIVES



Mitac AD-3C
Fully Apple compatible
½ height
$109

For Apple IIc/IIe, laser 128 Quiet, 6ms access time, a direct plug-in unit. 6-month warranty.

Laser FD100 ½ height $115
For laser 128, Apple IIe or IIc. Quiet. 6-month warranty.

SPECIALS

Z-Ram Ram & CP/M with CP/M disk, AppleWorks expander and RamDrive disk.
256K.....$229 512K.....$269
1 Meg....$359

MultiRam RGB for IIe, 80 column. New with RGB video output, built-in 65C816 CPU port, built-in port allows up to 2 Meg of battery-powered RAM to retain files and program in memory for up to 10 years. Free AppleWorks expander and utility program.
256K.....$189 512K.....$229

APPLIED ENGINEERING

(Genuine AE products, 5-year warranty)

GS-Ram for Apple II gs
256K.....$135 512K.....$169

RamWorks III for IIe, 80 column
Free AppleWorks desktop super expander RamDrive and printer buffer utility disk.
64K.....$139 256K.....$169
512K.....$209 1 Meg....$279

RamFactor for II, II+, IIe, laser 128
Franklin. Free AppleWorks expander.
256K.....$189 512K.....$239
1 Meg....$299 2-16 Meg..Call

TransWarp accelerator $209
New for II+ or IIe. Speed up your Apple

TimeMaster II HO $99
Support ProDOS and AppleWorks.

ViewMaster 80 for II+ $115
80 column board. Free AppleWorks preboot

Z-80+ for II+, IIe, laser 128 .. $115
4MHz, with CP/AM4.0 system disk.

Z-80C for IIc with CP/AM disk . $125

Z-Ram Ultra 1 Ram only
256K.....$149 512K.....$189

Z-Ram Ultra 2 Ram & clock
256K.....$199 512K.....$239

Z-Ram Ultra 3 Ram, clock & CP/M
256K.....$249 512K $289

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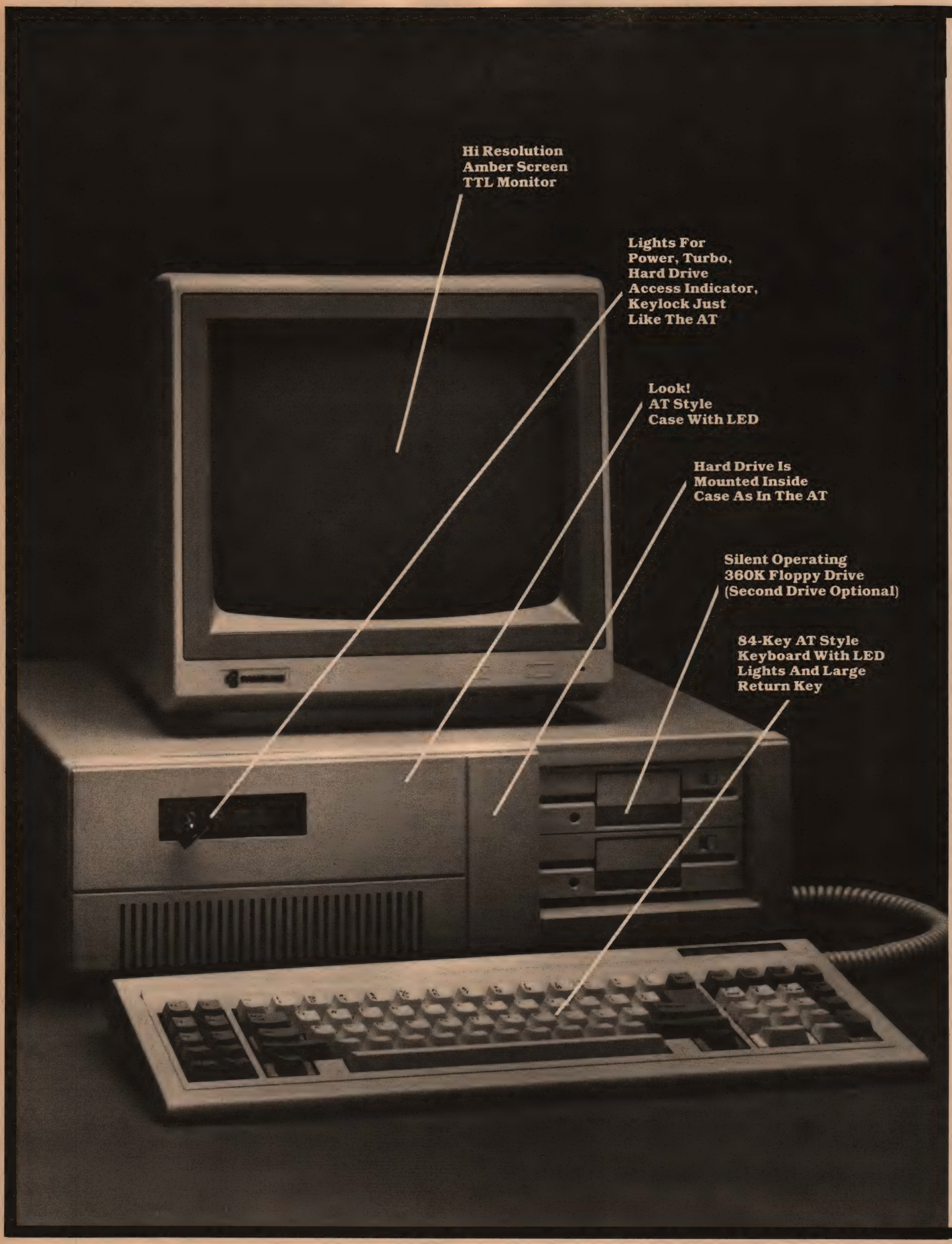
U.S. continent:	UPS ground	$6	$2
APO/FPO:	Postal ground	$15	$4
	Postal priority	$24	$7

We do not accept COD or credit charges to APO/FPO.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LOWEST PRICING EVER... For a superb quality, fully compatible XTurbo Complete System. Not just an everyday ho-hum clone, but a true IBM workalike in a handsome AT Style Case with dazzling speed and every feature you want in an XTurbo.

With keyboard switchable 4.77 and 8 MHZ speeds, the Olla XTurbo is an impressive package. It processes data two-thirds faster than the IBM XT. And with your choice of 10, 20 or 30 Megabyte hard drives, represents a truly exceptional value.

The Olla XTurbo comes to you assembled, fully tested and ready to use. Just plug the monitor to the mainframe and turn on the electricity. Use it for 30 days. If for any reason you wish to return it, there's no questions asked. (Fewer than .001 ever come back).

Dollar-for-dollar, feature-for-feature, there's simply no better buy in the world. Olla's massive purchasing power, combined with our unique direct marketing method makes it possible to bring these outstanding values to you. Compare price, compare features. Then Phone Olla!

Look! You Get All These Features At Industry Low Prices:

1. Dual Speed—Keyboard Switchable
2. 640K Mbrd., 256K RAM Installed
3. 8087 Co-Processor Socket
4. Eight Expansion Slots
5. 135-Watt Power Supply
6. Front Panel Turbo/Power/HD Lights
7. Can Boot-up in Turbo Mode
8. Unique, Heavy-Duty AT Style Case
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10. Runs all MS-DOS programs including 1-2-3, Flight Simulator, etc. and GW BASIC
11. Brand New (Not Rebuilt) Famous Brand Hard Drive and Controller Card
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Equity III+ continued from page 99

Epson Equity III+ Specifications

CPU & Memory

16-Bit CPU	80286 microprocessor, 6, 8 and 10 MHz selectable clock speed Real-address (8086 compatible) and protected virtual address (multitasking or multiuser) modes 24-bit address & 16-bit data bus
Math Co-processor	80287 support with coprocessor clock speed selectable (up to 8 MHz)
Main Memory	640KB RAM on main system board (15.5MB RAM max. with memory expansion cards)
ROM	64KB selectable EPROM pairs (expandable to 128K bytes)

Interfaces

Serial	RS-232C, programmable asynchronous, DB-9P connector
Printer	Standard 8-bit parallel, DB-25S connector (Centronics compatible)
Floppy Disk Controller	Supports two drives maximum with multiple formats; double-density (360KB) and high-density (1.2MB). Installed in I/O expansion slot.
Hard Disk Controller	Supports two drives maximum with multiple formats. Installed in I/O expansion slot
I/O Expansion Slots	Nine total; seven with 16-bit bus and two with 8-bit bus, seven available in base configuration
Speaker	Internal with volume control
Clock/Calendar/RAM	Real-time clock, calendar and 64 bytes of CMOS RAM w/battery backup
Power Supply	Switching type, fan cooled, 115/230VAC, 192W +5VDC, +12VDC, -5VDC, -12VDC
Mass Storage	Five half height devices maximum
Standard	5.25" half height floppy disk drive; double-sided, high-density, 1.2MB storage capacity
Optional	5.25" half height floppy disk drive; double-sided, high-density, 1.2MB storage capacity
Optional	5.25" half height floppy disk drive; double-sided, double-density, 360KB storage capacity
Optional	5.25" full height internal hard disk drive; 40MB storage capacity

Keyboard

Detachable 3-position, 101 sculpted keys Enhanced IBM PC/AT-type keyboard layout; 58-key QWERTY main keyboard; 17-key numeric/cursor pad; 12-function keys x 3 levels (normal, shift & alternate; user definable)
LEDs for (caps/num/scroll) lock keys

Environmental Requirements

Temperature	
Operating range:	41°F to 104°F (5C to 40C)
Storage range:	22°F to 158°F (-5C to 70C)
Humidity	
Operating range:	10% to 80% non-condensing
Storage range:	10% to 90% non-condensing

Physical Characteristics

	CPU	Keyboard
Width	19.6 in.	19.3 in.
Depth	17.40 in.	7.70 in.
Height	6.60 in.	1.80 in.
Weight	31.9 lbs.	3.90 lbs.

Power Requirements

115VAC, +15%, -20%, 60Hz, 4A
230VAC +/-15%, 60Hz, 2.5A

Epson Equity III+ Options

Monochrome Video Board	—Supports Epson or IBM PC-compatible monochrome monitor —80 character x 25 line display —9x14 character block —Installs in I/O Expansion slot
Color/Graphics Video Board	—Supports Epson or IBM PC compatible RGB color or composite video monitors —40 characters x 25 line display (low resolution text) —80 character x 25 line display (high resolution text) —640 x 200 (high resolution graphics), 8 x 8 character block —Installs in I/O Expansion slot
Multi-Mode Video Board	—TBA
TTL Monochrome Monitor 12" Diagonal	—High-persistence green P-39 phosphor screen —Etched surface to reduce glare —22 MHz bandwidth —720 x 350 resolution
RGB Color Monitor 13" Diagonal	—640 x 200 resolution (Additional specs TBA)
Enhanced Color Monitor 13" Diagonal	—Automatically selectable resolution (640 x 350 or 640 x 200)
Epson Mouse/ Interface Board	—Two button mouse with interface board —Installs in I/O Expansion slot
Ship Date	—1st Quarter 1987

100% IBM COMPATIBLE

30 Days Money Back Guarantee
One Year Warranty Parts & Labor

XT TURBO $649

- 4 Layer Turbo Board (4.77/8 MHz.)
- 8088-2 CPU w/8087 Socket
- 640K RAM on board
- 135W Power Supply
- 2 FUJITSU 360K Disk Drives with controller
- AT Style Keyboard
- Mono or Color Graphics with print port
- Slide-in Case with 8 expansion slots
- User's Manual
- Assembled and tested in U.S.A.

XT ADD-ON

- Multi I/O Card $75
- RS 232 Serial Card $25
- Western Digital WX2 Controller with cable $95
- Mono-Graphic w/print port $75
- Color-Graphic w/print port $65
- I/O Plus II Card $60
- K155, K151 or Max Keyboard $70

SPECIALS

- Seagate 20MB (ST225) w/WD Controller, cable $369
- MicroScience 10MB Hard Disk w/Controller $329
- FUJITSU 360K Drive ..... $ 79
- TEAC 55BV Drive ..... $ 89
- TEAC 55GFV 1.2 Drive $120
- Cermetek Modem 1200TPC .. $125
- Casper 12" TTL Amber ..... $ 99
- Casper 14" Color $295
- Quimax 12" TTL Amber $145
- Quimax 14" Color $335

AT TURBO $1295

- 6 and 8 MHz. Dual Speed (6/10 MHz. add $50)
- 80286 CPU w/80287 Socket
- 1024K RAM on board
- 200W Power Supply
- 1.2 MB TEAC Disk Drive
- AT Style Keyboard
- Western Digital WA2 Disk Controller
- Real-time Clock and Calendar with Battery Back-up
- Slide-in Case w/Key Lock
- Assembled and tested in U.S.A.

AT ADD-ON

- Western Digital WA2 Controller with cable $185
- 2 Serial, 1 Parallel Card ..... $ 75 (2nd serial optional)
- Multifunction Card (3 MB Expansion) $185
- AT Slide-in Case ..... $ 90

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Wash & HotDOS! continued from page 100

replaced.

Delete (D) File (changed to CONTROL-D to reduce accidents)—The file with name corresponding to the currently displayed list name is deleted from the disk directory. After deletion the message "Deleted" is displayed at the console. Deleted file name is also removed from the in memory list.

Rename (R) File—The file name currently displayed is renamed to the operator entered name in response to the "New Name ?" prompt. The list in memory is also updated to reflect the new file name.

Exit (X) (may also use, Q or Control-C)—Command when entered will terminate Wash operation and return system control to the CP/M Console Command Processor via a warm boot operation.

Start (S) over on New Drive—Entry of the Start over command will cause the Wash program to make up a new directory name list in memory from the drive designator entered by the operator in response to the "New Drive ?" prompt.

In spite of inability to implement sub-directories, Wash is by no means obsolete. It surpasses many commercially-offered file management utilities and impresses with its trim size. It belongs on every master software disk! Try it, you'll like it!

HotDOS!

In many ways, this program emulates the commercially-successful DoubleDOS (Soft-Logic Solutions, 530 Chestnut St., Manchester, NH 03101), but is marketed under the "shareware" concept. It was released in mid-1985 by the Robert Best (13681 Dall Lane, Santa Ana, CA 92705). Suggested fee for a satisfied user, $20.

HotDOS is a small but powerful engine for creating two separately-operating partitions in any PC with sufficient memory. In effect, HotDOS creates a DOS shell for programs that do provide a built-in temporary exit to DOS. The pressing of the CTRL-LEFT SHIFT allows any currently executing program to be temporarily suspended so that a second copy of COMMAND.COM can be loaded and run in foreground. Two programs can therefore be loaded at the same time, but only the foreground program can actively process at any one time.

One can exit from the second partition back to the first by typing EXIT at the DOS prompt. These are the optional parameters available at the command line when executing HotDOS:

'G' or 'g'—For use on a system using Color/Graphics display. This program will fully restore any CGA graphics screen at the expense of an additional 12K memory for use as a buffer. It will not restore an EGA graphics display, but is compatible with EGA text modes.

'X' or 'x'—For use on a system supporting BOTH monochrome and color/graphics displays. This program will activate HotDOS on whichever display is NOT active when the HOT-KEY is pressed. From that point on, the user can freely switch displays—HotDOS will properly restore the display that was active prior to escaping to the HotDOS partition.

This is an indispensable utility for users who require simultaneuos viewing of two separate screens of data. As an example, one can run a text editor in the primary DOS partition, then switch to HotDOS for code compilation. This arrangement spares the nuisance of exiting and reloading the editor, as well as allowing viewing of compilation errors simultaneous with editing the source code.

Both the 'x' and 'g' options can be combined when running HotDOS. To load, use the following syntax (where n = requested size of HotDOS partition in K—the default is n = 64K).

HOTDOS [n] [/x] [/g]

For some examples, see Figure 2.

```
HOTDOS                  [n=64K, no graphics, one screen]
HOTDOS 100 /g           [n=100K, CGA graphics restored]
HOTDOS 250 /x           [n=250K, two screens]
HOTDOS /x /g 100        [n=100K, graphics, two screens]
```

Figure 2— Examples of HotDOS commands

HotDOS uses the value of the environment variable Comspec to determine the path to the COMMAND.COM command interpreter. It will use the value of COMSPEC that existed just prior to being loaded for the duration of execution. Use the SET command in an AUTOEXEC.BAT file if a path is needed, for example, to a virtual disk designation.

Tips For Using

Do not load any resident application in the HotDOS partition. Doing so will surely destroy the integrity of the DOS memory allocation chain. All other resident software must be loaded in the primary DOS partition. Do not load any application that will overlay without checking for the top of memory location stored in the Program Segment Prefix, Best warns. A program that overlays above the top of available memory (in the HotDOS partition) will overwrite the memory chain block of the primary application, not to mention the PSP and part of the primary application itself!

Best suggest that you do not load BASIC in the HotDOS partition if BASIC is currently suspended in the primary partition. If you mistakenly type EXIT at the DOS prompt in the primary partition, immediately run a CHKDSK on any drive configured in your system, in order to avoid possible file damage. It is strongly suggested, if not absolutely required, to load HotDOS first among resident applications. In particular, you must load Sidekick after loading HotDOS.

HotDOS is an interesting utility. It works best in older applications that you may still use, but which provide no built-in exit to the DOS shell, for example WordStar 3.3. With HotDOS, such a facility works just as well as though it were built in. Many would-be techies (the source code is available from the author) will have fun just finding other uses for it, I'm sure! ●

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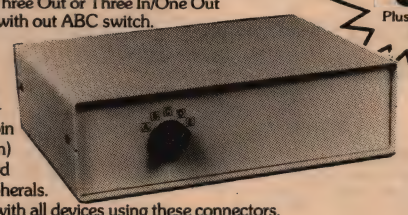

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Hard Disk Management

continued from page 100

Installation of 1DirPlus is quite simple. The master disk is not copy-protected, so a backup copy or copies can be made immediately. Then it is simply a matter of running the install program as shown in the documentation. This sets up a 1DirPlus sub-directory and then gives you the option of adding 1DirPlus command to the end of your autoexec.bat file. 1DirPlus can be used with a two floppy system, but it requires 240K of disk space on your boot disk. Consequently, I would not recommend it for a floppy based system. 1DirPlus is also a heavy user of RAM. It will occupy 80K in its fully resident mode and 16K when the partial resident mode is selected. The partial resident mode does significantly slow down the return of the menu screen after completion of an application program or a DOS command. But, if you don't have a full 640K of RAM or an extended memory card, the partial resident mode may be your only choice. This also depends on the amount of RAM required by your application programs. 1DirPlus does work quite well with other memory resident programs like SideKick. At one time or another I have had the Logitech Mouse, print spoolers, Turbo Lightning, Pop-Up Calendar, PC Anywhere, and Ready sitting in memory along with 1DirPlus. None of these have conflicted with 1DirPlus.

I guess the next step is to try to give you an overall view of what can be done with this program. Frankly, it has so many features it is almost impossible to adequately review them all. The various menus contain the most used DOS commands such as, copy, erase, rename, format (drive A), diskcopy, backup or restore a sub-directory and make a subdirectory. These are all called by a single function keystroke. (Figure 3.) In addition these commands can be used on a single file or a group of files. There are also some very special file management commands not found in DOS. These include changing the file attribute to read only, read and write, or to hide or unhide a file. Thus you cannot only unhide normally hidden files like the DOS system files, it allows you to list your directory copy protection files which may be hidden on your hard disk. And, you can hide your own files that you don't want others to see in your directory listing. These file management commands are built into the programs standard menus and are all accessible from the main menu by a function key (Figure 5). In this figure you notice the last menu is blank. This is because you can fully customize this menu to run your application programs. If you have more than eight programs, there are two other menus available for your use.

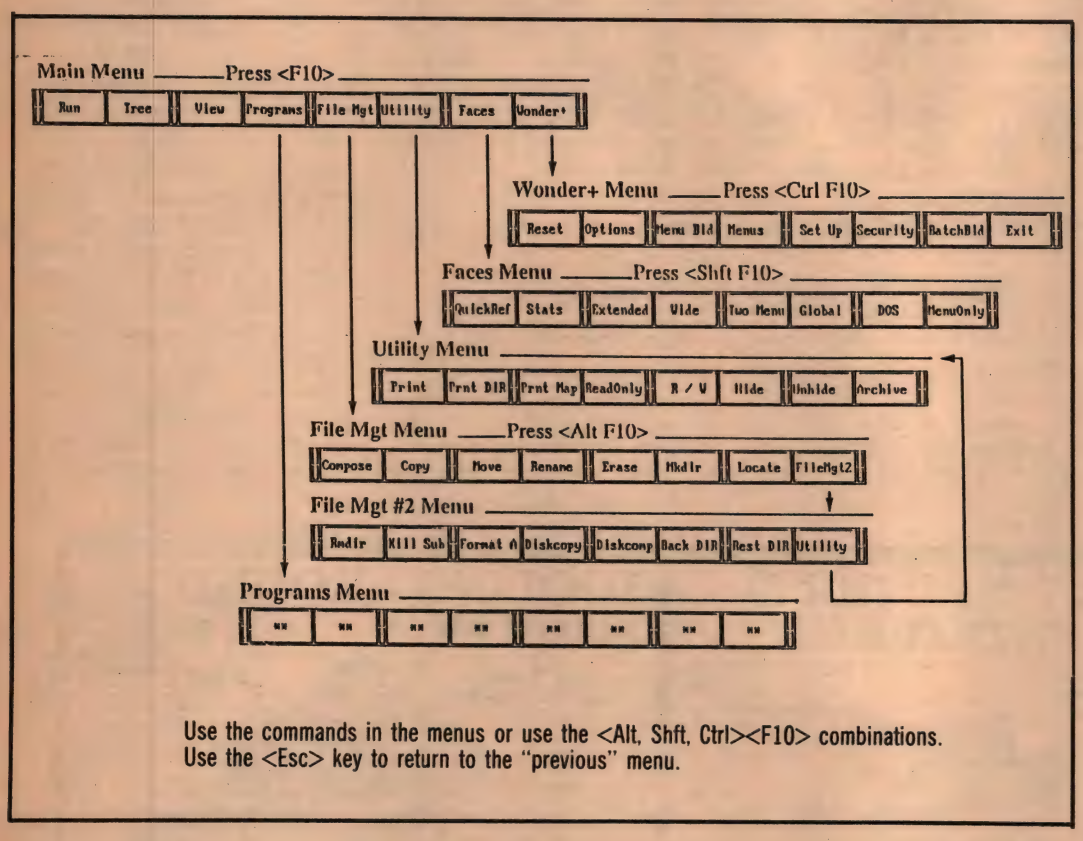

Figure 5. Illustration of the menu relationship of 1DIRPLUS. The lower level menus can be accessed from the main menu by the function keys or by the indicated "hot" keys.

1DirPlus includes a directory map or tree for viewing the directory structure on your hard disk. This can also be used for changing directories, moving files or selecting a destination for a multiple file copy operation. It can also help you find that sub-directory that is three levels down in some other directory!

One function that I use frequently is the View/Editor command on the main menu. This command allows you to look at the contents of any file, including binary files. However, it is most useful as a replacement for the DOS Edlin text editor. With this command you can review, edit or create a file. Once you have selected a file with the View command you can simply read it one page at a time (no rapid scrolling off the screen as with the Type command), changing pages with the PgUp and PgDn keys. Pressing the F10 key brings up a menu as shown in Figure 6. Using this menu you make any editing changes you want, print the file, create a new file or open an existing one, etc. You can also print a portion of the file, either a marked block or the present screen. Pressing the exit key gives you the choice of saving your changes, leaving without saving or going back to the edit mode. The editing commands make full use of the direction keys for cursor movement. And, you can also use the Wordstar Diamond keys if you are familiar with them. As this is primarily an ASCII file editor, there is no word wrap at the end of the line. Each line must be terminated by pressing the <ENTER> or <RETURN> key. One of the nicer features of this editor is its ability to display files in HEX mode. In this mode there are two windows, one in HEX and the other in extended ASCII. The tab key allows you to toggle between the windows and editing can be done in either window. This editor is nice, but it should not be your primary reason for buying 1DirPlus. Its more like the frosting on the cake, a nice added attraction.

The main attraction of 1DirPlus is its custom menu system. This allows you to design custom menus for running your application programs. Once this system is installed, you no longer have to remember batch file names or whether you have to change to a specific sub-directory to call a program or anything like that. Instead, you move to your program menu (F4) on the main menu and your applications now show under the function key designators. Press the appropriate key and your

continued on page 168

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_ Compare File(s)
_ Sort File(s)
_ Find File(s)
_ Replace File(s)
_ Recover File(s)
_ Display Directory
_ List-Sub Directory
_ Change Directory
_ Create Directory
_ Erase Directory
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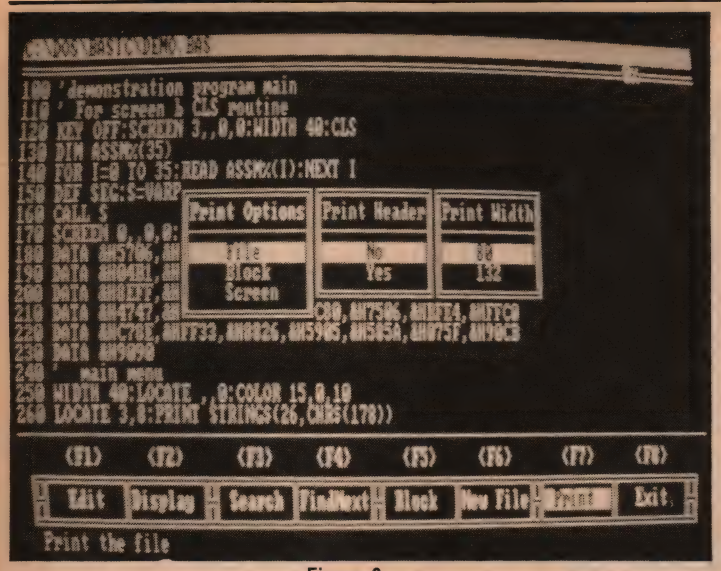

Figure 6

Hard Disk Management continued from page 166

application is off and running. That's the end result, getting to that point is a little more difficult. You must first move to the Wonder + Menu and select the Menu Bid option (Figure 5). This brings up the Command and Menu Builder (Figure 7). This menu allows you to set up new menus and their associated commands. At this point I would recommend your ignoring the documentation and following the menu instructions, using the HELP key (F9) if needed. I found the on screen instructions much easier to follow than the instructions in the documentation.

Once you reach the Application Command template, you enter the program name and the commands you would normally use to run the program (Figure 8). This is similar to the commands you would have entered directly from the keyboard or possibly put into a batch file to run your program. Once this process is completed, pressing the ESC key brings up the Save Options. Save/Exit returns you to the Command & Menu Builder Main Menu. I found that after setting up a few applications and testing them, that the process becomes quite simple and easy to use. So my recommendation is jump in and try it! If you make a mistake, its easy enough to correct it and the menu allows you to delete complete commands or menus. You will be delighted on the ease of use of your application menu once you have completed the setup process. It is certainly worth the effort.

My one big objection to 1DirPlus is that it can be intimidating to the novice user. Looking at the documentation and the quick reference card, there are so many options, so many ways to accomplish the same thing (Hot keys vs. menus), that it seems there are too many new commands to learn. Actually, the novice doesn't need to learn the new commands. Simply following the menus will allow you to become accustomed to the program. In fact, I would put the quick reference card away and totally ignore it until you have several months experience in using 1DirPlus. The same can be said for much of the documentation. Use only the beginning chapters, primarily the introduction and installation, to get you started. Then start using the program, referring to the documentation only as necessary. The table of contents and the index will help you quickly find what you want. The on screen help (F9 key) should also be used before referring to the documentation. Its not that the documentation is bad or poorly written, for it is not. It is just more than the novice needs for starting out. I would like to see the documentation divided into a section for the novice and one for the experienced user. Then it might not appear so overwhelming in its commands and options.

Command & Menu Builder--Main Menu	
Option	**Description**
F1 = Create Command	Use to program a new command
F2 = Modify Command	Use to change an existing command
F3 = Delete Command	Use to remove an existing command
F4 = Create Menu	Use to make a new command menu
F5 = Modify Menu	Use to change an existing command menu
F6 = Delete Menu	Use to remove an existing command menu
F7 = Print	Use to print commands and command menus
F8 = Exit	Use to exit the Command and Menu Builder
Use the function keys <F1-F8> or the cursor keys <↑↓> to select the desired command. Then press <enter>.	

Figure 7

If you are experienced with earlier versions of 1Dir, then I think you will really like the new 1DirPlus, especially with the latest update. If you have never used a file manager and menuing system for your hard disk, then I recommend you try 1DirPlus. It is by far the most flexible and powerful of this category of software that I have seen. Try it, you'll grow to love it and wonder just how you ever got along without it.

1DirPlus File management and menuing system for PC/MCDOS computers. Available from: Bourbaki, Inc., 615 Hayes Street, Boise, ID 83701; 208-342-5849; List Price: $119. ●

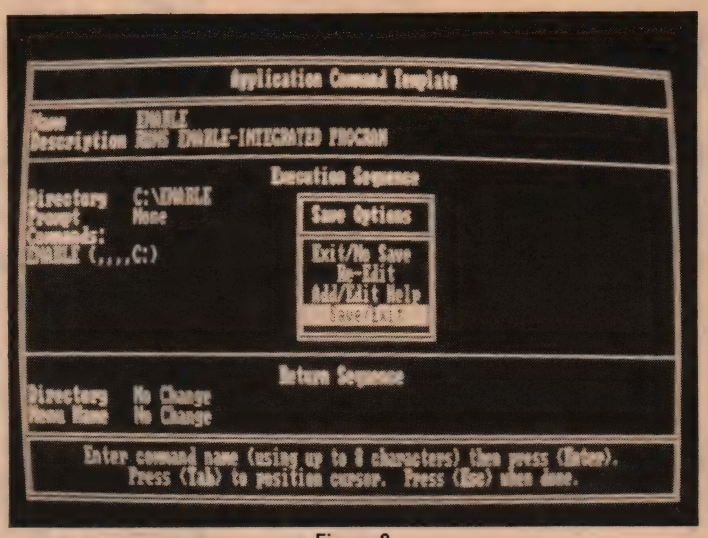

Figure 8

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Recover Corrupt Data Files

by Peter Ruber

The Problem Is Serious But Not Fatal

Over the last couple of years I have found that MSDOS is usually obliging. But occasionally it goes beserk and presents me with a disk that has a corrupt file structure. I will either be unable to access files on the disk or discover that portions of some data files have vanished in a trail of screen gibberish.

Most of the time I remain philosophical and calm by tossing the disk into the wastebasket. Other times, if I must have access to a locked disk or need to reconstruct a sick file, MSDOS' CHKDSK can offer a small measure of hope.

Your disk stores data on contiguous sectors, first on Track 0 on Side 0, then on Track 0 on Side 1, and so forth until all 40 Tracks are filled. However, once you start revising data on a partially filled disk, sectors will be overwritten and erased, and the drive will search for empty sectors on which to record each 512 byte cluster.

The File Allocation Table (FAT) provides the map of where the various clusters begin and end. The more times you access your disk files the more complex the trail becomes. Which is why long files sometimes take a few seconds to load into memory. DOS must locate the scattered clusters and reassemble them in the proper order.

What causes a corrupt file structure? There are several culprits. A sector may have become damaged or you may have failed to close a file before calling up another. This usually happens when you are switching back and forth between several data disks within a program, and close file when you don't have the original disk in the drive. The directory overwrites itself with the directory of another disk, and FAT can't locate the connecting clusters.

The magnetic coating on the disk has become damaged either through normal wear and tear or through mishandling. Even a momentary interruption of electrical power, followed by a power surge, can damage part of a disk. An electrical failure in the controller section, a floppy that is out of alignment. The cause, however, seems less important than the need to reconstruct the file, unless it is a hardware related problem that you have been able to trace through the diagnostics disk that came with your system.

Most MSDOS manuals advise you to periodically perform a CHKDSK on your disks to determine if they are free of any errors. Most of the time it is unlikely that you will encounter a problem, but a little preventative maintenance might save you some grief at a later time.

The First Order of Business

Although even the cheapest disks available on the market are certified to be 100% free of defects, it is a good idea to check them. A painless method is to use a copy of your DOS disk to which you have added a small batch file called NEWDISK.BAT that you call up after booting the disk.

```
1: REM This file checks new disks
2: REM It is named NEWDISK.BAT
3: PAUSE Insert new disk in drive B:
4: FORMAT B:/S
5: DIR B:
6: CHKDSK B:
```

This little program will prompt you to place a blank disk in drive B:. Then it will format the disk and place COMMAND.COM and the hidden system files on it so that it is bootable. It will display a directory and then check out the integrity of the disk. If it

continued on page 170

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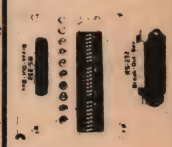
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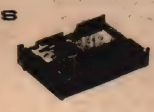
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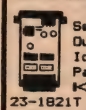
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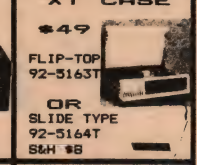
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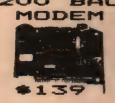
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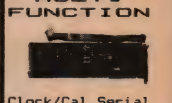
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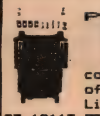
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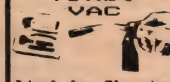
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Recover Corrupt Data Files continued from page 169

locates any bad sectors it will write them into FAT so that they aren't used. My advice, however, is to throw it out or return it to the manufacturer for a replacement.

Hard disk drives cannot be treated in this cavalier fashion because of their cost. If any sector errors are encountered, they will be blocked from use. And because of its size, a certain number of bad sectors can be expected to develop over the years without unduly affecting the performance of the drive.

If you wish to set up a new batch of disks for data storage, eliminate "/S" from line 4 and create a different name for the batch file in line 2. By having both batch files on your copy of the DOS disk, you can then use either one depending on your need.

Using CHKDSK

CHKDSK should be used with some care and caution. It is not a cure-all for a corrupted disk, but it can help you most of the time. It is simplest to use on a straight data disk. But if your floppy contains sub-directories, the situation becomes more complicated. In the case of a hard disk that has a corrupted file structure, the process becomes long and involved.

The first thing you should do after you have encountered any problems in accessing a disk or finding that part of your data file which has vanished, is to run CHKDSK. With your DOS disk in drive A and the data disk in drive B, type:

A>CHKDSK B:

CHKDSK will analyze the disk and provide you with a summary of the disk. If you note that the amount of available disk space is significantly larger than the number of bytes free, then the disk's directory structure has been damaged and it cannot locate the missing clusters.

Before you do anything, make a copy of the damaged disk. Use only the COPY *.* B: command. DOS manuals and reference books recommend that you don't use DISKCOPY because it creates a duplicate image of the disk. COPY tries to piece together any fragmented clusters of each text file into a contiguous file on the destination disk. As the files are copied from the original to the duplicate, they will appear on screen. If COPY encounters any problems in reading a particular sector on one of the files, it will display an error message.

If the problem is a minor one, COPY may succeed in joining together all the clusters of each file contiguously. But there is no guarantee to this. Some clusters may remain hidden. Use the TYPE filename.ext command to place a file that you know was bad on the screen. If it is displayed in its entirety, you may have reconstructed the file. However, if the file turns to gibberish or starts to include data from another file, things aren't normal.

Perform a CHKDSK B: /F. If the disk's problem is due to a corruption of the disk directory, the program will ask you if you wish it to fix the directory by answering "yes." But, if the problem lies in the file allocation table (FAT), you will get a message that is similar to this:

xxxx lost clusters found in xxx chains
Convert lost chains to files (Y/N)?_

If you answer "Y" for yes, CHKDSK converts into files the lost areas of the disk. These files will appear in the root directory of the disk and use the name FILExxxx.CHK. Your disk will now list all files in consecutive numbers from 0000 to 9999. You can then go through the files to determine which don't contain any useful data and delete them from the disk. The rest can be copied to a new disk with the appropriate file name that was originally assigned to it.

Using Recover

I should have mentioned earlier that you should confine using CHKDSK and RECOVER only with ASCII or data files. If you attempt to use them for program files you will not be successful, because you will likely lose part of the binary files and the program will either run flaky or not at all. With ASCII or data files any missing text can be added, and screen garbage can be removed by editing.

RECOVER should be considered as the Course of Last Resort because it will destroy those portions of your text files that are still readable on your original disk and recover the missing clusters. It is therefore advisable to make at least two copies of your damaged disk and use those with RECOVER. For this procedure I generally use DSKCOPY or COPY2PC for an exact image of the original disk.

When I ran RECOVER on a recently damaged disk I was told that the disk had—

187 lost clusters found in 51 chains. Convert lost chain to files (Y/N)?_

I typed "Y" and after some disk activity the screen listed all the corrupted files as—

Filename. Ext \ Is cross linked on cluster xxx

followed by a message that 62 files had been recovered. When I called up my directory all the recovered data files had been converted into numerical .REC files per the example in Figure 1.

```
                    Files on B:

FILE0001 REC    FILE0015 REC    FILE0029 REC    FILE0043 REC
FILE0002 REC    FILE0016 REC    FILE0030 REC    FILE0044 REC
FILE0003 REC    FILE0017 REC    FILE0031 REC    FILE0045 REC
FILE0004 REC    FILE0018 REC    FILE0032 REC    FILE0046 REC
FILE0005 REC    FILE0019 REC    FILE0033 REC    FILE0047 REC
FILE0006 REC    FILE0020 REC    FILE0034 REC    FILE0048 REC
FILE0007 REC    FILE0021 REC    FILE0035 REC    FILE0049 REC
FILE0008 REC    FILE0022 REC    FILE0036 REC    FILE0050 REC
FILE0009 REC    FILE0023 REC    FILE0037 REC    FILE0051 REC
FILE0010 REC    FILE0024 REC    FILE0038 REC    FILE0052 REC
FILE0011 REC    FILE0025 REC    FILE0039 REC    FILE0053 REC
FILE0012 REC    FILE0026 REC    FILE0040 REC    FILE0054 REC
FILE0013 REC    FILE0027 REC    FILE0041 REC    FILE0055 REC
FILE0014 REC    FILE0028 REC    FILE0042 REC    FILE0056 REC

          NAME OF DOCUMENT TO GET:

PgUp, PgDn - More File Names                    F10-Continue
```

Figure 1

Now came the fun part. Since my damaged disk was prepared with PFS:WRITE, which doesn't create ASCII text files but has its own peculiar program language, I had to enter the program itself and retrieve the files. With programs such as Wordstar, Word, etc., that do create ASCII text files, it is faster to read and identify each new data cluster through the TYPE command.

After an hour or so, I located the missing sections of an article as 0014/0015/0016/0021/-0047/0049. Then, using a new disk, I copied the opening pages from the original corrupted disk, and then added those sections that had been locked out. After linking them together under a new file name, I was able to edit the text by removing unwanted characters and supplying some missing words that belonged at the beginning and end of each file.

To say the least, it is a bothersome exercise, but one appreciates the power of some of the DOS utilities in creating order out of chaos.

Hard Disks & Sub-directories

The MSDOS CHKDSK AND RECOVER programs will also work with disks containing assorted sub-directories—including hard disks and floppies. In the case of hard disks, you must first back up the entire hard disk sub-directory by sub-directory, and then check out each backup disk. Since you will also be using the BACKUP and RESTORE utilities, I would suggest that you study all the pertinent utility programs in your DOS manual before you proceed down the painful road of recovering your files.

While the DOS manual can be a bit cryptic at times, you might wish to obtain a copy of Chris DeVoney's *Using PC DOS* (Que Publishing, Inc., 7999 Knue Road, Indianapolis, IN 46250). This is one of the more thoughtful books on understanding the intricacies of DOS by an author who is an acknowledged expert on its mysterious ways.

What I have tried to present here is merely an overview on recovering lost or locked data files. The procedures outlined may not be suitable for every disk since there are numerous options that take into account special problems. *Using PC DOS* will explain them to you.

Preventative Measures

If you've had a history of occasional disk problems, it helps to keep in mind the following method of reducing, if not entirely eliminating the problem.

If you have any disks that you access periodically to work on data files, use COPY *.* B: to place them on a blank disk so that each file is located into a contiguous block of sectors. This is almost mandatory in the case of files which undergo frequent modification. Such disks will have their clusters scattered hither and yon, and the file allocation table can get confused. And if the data is of archival importance, make a backup copy of the data disk.

I hope you never have to use the RECOVER program, but if a disk goes haywire you won't have to feel that your valuable files are lost forever. Perform a CHKDSK now and again to ensure the integrity of your directory and file allocation table. If there is a minor problem, CHKDSK may be able to correct it before it is compounded.

Having now been bitten by several corrupted disks in recent months, I think that I will take my own advice for a change. ●

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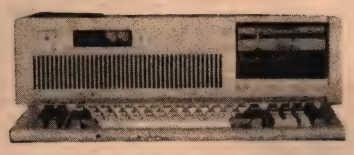

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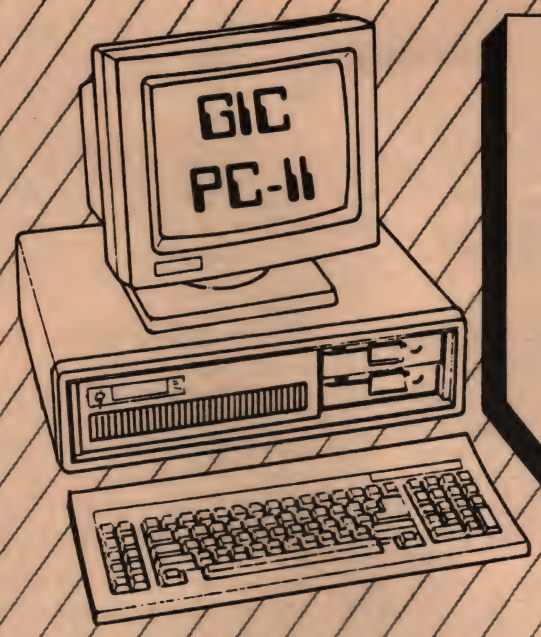

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Setting Up Foreign Languages On A PC

by Hal Nieburg

You can turn your average American PC into a foreigner, quickly and easily, directly from DOS, without special font software. Once the European character set is loaded, it replaces the default set loaded from the ROM-BIOS at bootup. A simple keyboard entry can toggle the PC back and forth between the foreign or the native character set at any time.

The US is culturally and economically interdependent with the rest of the world, as IBM, the world's largest transnational corporation, well knows. And IBM is conceding no countries to its competitors. DOS designers decided to bundle at least six European character sets as standard equipment. And they made them easy to install.

The languages supported are French, German, Italian, Spanish, and UK. (Others are available as separate packages.) In addition to accents, special characters, diacritical marks, there is also provided the correct money symbol and date format for each country (that is why United Kingdom, which of course speaks English, is included).

Once the foreign language character set is loaded, either automatically from AUTOEXEC.BAT, or ad hoc from the keyboard, it not only loads the new character set, but modifies the keyboard in accordance with the key assignments which are normal for the other languages. In German, for example, among other transpositions, Y and Z change places. A German typist accustomized to the keyboards of his/her country, will find the PC in exact compliance in every respect.

How To Use The Files

To transform the PC into a European requires two commands:

1) The first command must be placed in the CONFIG.SYS file. This is automatically read by DOS at a mid-point during bootup (prior to reading and executing the AUTOEXEC.BAT file), must include a COUNTRY line. This allows DOS to adopt the appropriate country's conventions of international time, date, currency, and case (proper upper and lower) conversions. The syntax (with the "xxx" representing a code number of each country as provided in the DOS Manual) is,

COUNTRY = xxx

The code numbers coincide with the 3-digit country system adopted by the International Telecommunication Agency for telephone prefixes. The DOS manual provides 15 such options (the telephone directory provides all of them), as follows:

US	001 (the DOS default)
Netherlands	031
Belgium	032
France	033
Spain	034
Italy	039
Switzerland	041
UK	044
Denmark	045
Sweden	046
Norway	047
Germany	049
Australia	061
Finland	358
Israel	972

For changing to a foreign language, it is a good idea to install the driver that permits "extended screen and keyboard controls," called ANSI.SYS. Just include (and make sure the file of that name is present on the same directory) the line,

DEVICE = ANSI.SYS

CONFIG.SYS is useful for a variety of purposes. This includes loading special device drivers (for example, external disk drives or virtual disks), preparing the operating system for programs like WS2000 or MicroSoft WINDOWS, that hold multiple files open simultaneously, and creating cache buffers. Such files can be written by any straight ASCII word processor, by use of EDLIN.COM (the line editor provided by DOS), or, the simplest way, by means of the built-in COPY CON ("copy from the keyboard") procedure. For detail, see the DOS Manual.

2) The second command can be entered from the keyboard at a DOS prompt, but works best if written into the AUTOEXEC.BAT file. The system file COMMAND.COM automatically runs any file by that name during bootup, executing each line in order. The method for writing such batch files are the same as above, and the DOS Manual is fairly lucid on this matter. The line syntax is as follows:

[path] KEYBXX

The path command tells DOS where, if you are running off a sub-directory on a hard disk, the file is stored. It is not necessary if the file is on the root directory, and the root directory is the default. Should it be on other than the default drive then it may be necessary to include the drive designation before the path command. The last two digits of the foreign language installation command are the 2-letter codes for the various languages. The five language abbreviations are self-explanatory—KEYBUK.COM, KEYBGR.COM, KEYBFR.COM, KEYBIT.-COM, and KEYBSP.COM.

Running this command creates a memory-resident block that re-defines the keyboard and the character set, replacing the default that were loaded from EPROM firmware. The size occupied in RAM varies with the complexity of each character set, but is fairly modest. For example, German takes 2688, French 2704, and others in the same ranges. The CONFIG.SYS installation takes about 14K in memory.

If you are booting from a hard disk, the PC will always begin a work session initialized for a foreign language. If you are using floppies, it will only be necessary to see that all your software master disks contain the appropriate CONFIG.SYS, AUTOEXEC.BAT, and KEYBXX.-COM files, which altogether only occupy about 5KB. These are the essential files and their sizes (using the German as typical):

CONFIG	SYS	60
AUTOEXEC	BAT	18
ANSI	SYS	1651
KEYBGR	COM	3274

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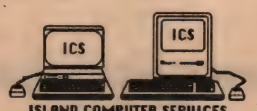

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Setting Up Languages
continued from page 172

If space on the master floppy is critical, then one can boot from a DOS disk with all the necessary setup routines similarly in place. After bootup, the master software floppy replaces the DOS disk in A: drive, and you are in business. Once in memory, the PC perfectly emulates (in fact becomes) a foreign language machine, and can be toggled back and forth from US to foreign by simple keyboard strokes.

The makers of DOS were far-sighted and wise to make this transition so simple. Pressing CONTROL-ALT-F1 will return the configuration instantly back to the US; pressing CONTROL-ALT-F2 will return the keyboard to the installed foreign language. Because of this feature, there seems no reason for those who occasionally need the foreign language features not to install the files permanently for automatic bootup at every work session.

Extended Character Set

It must be noted that the same special characters can be accessed from the default keyboard, without installing any of these files, by use of the ALT-NUM pad decimal code. This is much more complicated and inconvenient, but can be used to mix different special characters from many different languages in the same text file.

At the cursor position, you hold down the ALT key, and then punch out on the numeric pad the 3-digit decimal code of the character desired. Then, when the ALT is released, the character will appear on the screen at the cursor position.

The 24 foreign language characters are grouped under decimals 128 through 154. If you cannot find a list of the extended character set, it is a simple matter to identify the characters by experimenting at the keyboard. For example, if you hold down the ALT key, and punch 129 into the num pad, you will print to the screen a lower case "u" with an umlaut.

This is the procedure that must be followed to embed Latin letters and a variety of special characters, including math symbols, in text files. Latin is present with 14 characters grouped under decimals 224 through 338. Various other symbols, including line and box drawing figures, are numbers from 001-031, 155-223, and 239-255. All those funny symbols like musical notes and smiling faces, that you see on the screen occasionally, are part of the latter groupings of the extended character set.

With some color/graphics boards, it is sometimes necessary to install the DOS file GRAFTABL (load graphics table). This is done once from a DOS prompt and becomes memory resident (just 1K). This provides a data table which some video boards require to properly print to screen characters between decimal 128 through 255. If you can't get graphics characters to print to screen, try loading this utility first. I have not found it necessary for most word processors. Definitely try to do without it in the first instance.

Software Compatibility

Once a foreign language set is installed, it will work in DOS, and in most other software. However, many word processors have their own facilities for changeover to a different language. They generally define their own keyboards, in the process overriding the changes installed by these routines. When that happens, the default keyboard will pop up inside an active program, in spite of our bootup efforts. Then we have no alternative but to pursue the separate configuration procedures, if any, provided by the software package itself.

Some, like WordStar 3.3, will not recognize the foreign keyboard, and charges extra for the foreign language installation utility. Some, like xx, do not implement the IBM-MicroSoft procedures, and do not provide changeovers of their own. In the latter case, you had better check before buying, and not buy such software if you need the capability.

I checked on a number of popular word processors that were available and found:

Does Not Implement KEYBXX

PCWrite 2.55
WordStar 3.3
XyWrite II or III

Does Implement KEYBXX

FrameWork II
IBM Writing Assistant
IBM Display Write Assistant
IBM Personal Editor 1.0, 2.0
MicroSoft Word III
PCWrite 2.6 and 2.7
PFS:First Choice
PFS:Write
Word Perfect 4.1, 4.2
WordStar 2000, 1.0, 2.0

Printing Foreign Characters

Once a foreign language is installed into a PC, the problem remains of getting the same characters on hard copy that appear on the screen. I am not in position to do exhaustive research on this, but can report some general facts and principles.

Generally speaking, there is always a way to get dot-matrix types to print out exactly what

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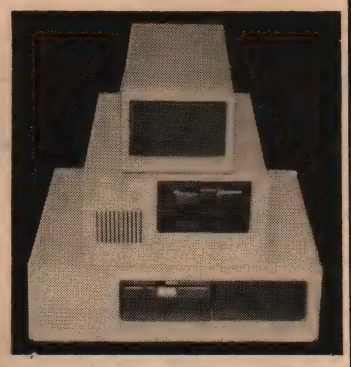

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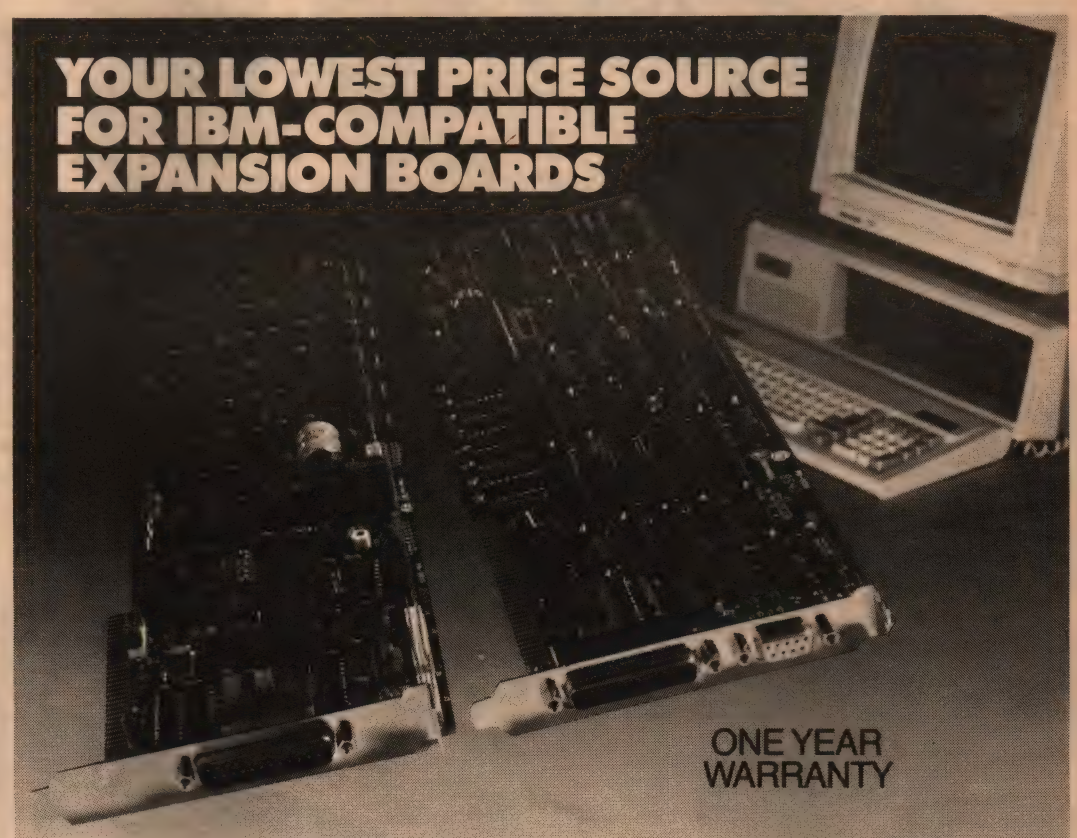

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Setting Up Languages continued from page 173

is on the screen. Printers compatible with the IBM-Graphics standard, like the ProPrinter, will do the job directly without any special programming or dip-switching.

Some dot matrix and daisy wheel printers will print the special characters if first properly tuned by re-setting dip switches and/or running special software, which provide the right translation of printing codes and, once set, usually by a consultant or technician, will do the job. In addition, for a daisy wheel printer, the correct foreign language font wheel must be in the machine.

There are too many printers to list here, but be alerted to this dimension so as to avoid misunderstandings with your dealer. A good example is provided by Epson (or compatible) dot matrix printers, most of which use the same DIP switch arrangements. The factory setting is the USA default: toggles 6, 7, and 8 of Switch 1, all in the ON position. The following chart shows all of the permutations and combinations for setting these three toggles on Switch 1 for the following languages:

Country	Switch 6	7	8
France	on	on	off
Germany	on	off	on
UK	on	off	off
Denmark	off	on	on
Sweden	off	on	off
Italy	off	off	on
Spain	off	off	off

Of course, virtually any unmodified dot matrix printer will print in hard copy whatever is on the screen, including all foreign language characters, by screen-dumps *in the graphics mode!* This can be accomplished by first switching to graphics mode by entering "GRAPHICS" at the DOS prompt. You are limited to screen dumps (Shift-PrtSc keys), but these will be in high-resolution and can be very useful as illustrations or transparencies for computer instruction, for book reproduction, or to create attractive posters.

What if you require foreign language fonts that are somewhat rare, or are not available at reasonable cost from IBM or specialty software vendors? Well, you can create you own character sets with free or "user-supported" high-quality software. What if you need Hebrew, Arabic, Cyrilic, Turkish, Chinese, or Czech, to name a few? One can acquire such ready-to-go character sets for any natural language, but they may be expensive and may require special hardware (such as the EGA adapter).

The solution comes from a number of software offerings that permit users to design their own character sets from scratch. I will mention two such font designers/word processors.

CHIWRITER is a font editor and scientific word processor, available as freeware or, with full implementation, at a neglible price, CHIWRITER makes special symbols, mathematical formulae, and foreign language characters available on ordinary micros. It is a what-you-see-is-what-you-get full function word processor allowing editing with multiple fonts and super/subscripts right on the screen. Up to twenty fonts (almost 2000 characters) and unlimited levels of super and subscripts are supported.

By any standard, CHIWRITER 2.06 is an extraordinary value. Also clean and mean for even neophyte users. The price of the newest release is $79.95. The "Pirateware" version is $9.95 from the author (Horstmann Software Design, P.O. Box 4544, Ann Arbor, MI 48106, 313/663-4049), who uses the latter term to distribute a full working copy of the program without the Font Editor.

Special printer extensions, additional pre-configured fonts, and printed documentation are available at equally reasonable cost: Toshiba, Hercules Monochrome Board, EGA High Resolution support are each $19.95; HP Laser Jet Laser or Jet Plus support are $49.95 each; Font Pack #I is $19.95; program update from registered users is $9.95; the manual is $19.95.

Offered gratis to all comers, the Duke Language Toolkit (latest version is 2.20) is a collection of programs and interfaces of astonishing virtuosity and inventiveness, developed originally at Duke for their own work. Now anyone can send in two blank disks and receive promptly the complete set with full documentation. Send the disks to Prof. Jeffrey Gillette, Language Project, Duke University, Durham, NC 27706.

The materials on the diskettes are of four sorts: 1) executable programs by which one may design new alphabets (fonts) and incorporate them into the computer; 2) some sample fonts; 3) sample text created using the Language Toolkit; and 4) keyboard and printer files to be used in conjunction with certain word processors. An EGA video board is required.

Yes, your average American PC can readily adopt the accent and elegant air of a European sophisticate! IBM and MicroSoft have bundled in DOS the magic wand that transforms your micro into a suave Parisian, a kurt Berliner, the noblest Roman of them all. ●

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SNOBOL4: The Standard For Strings

by Ed Quillen

Every now and again, you read about a new or improved programming language, and you see something like "FORTULA manipulates strings as well as any language except SNOBOL4," or "This implementation of NEWTON provides excellent string capabilities, but nothing like those of SNOBOL4."

Which leads to the question: What is SNOBOL4 and why is it the standard for processing strings?

As programming languages go, SNOBOL4 is an elder statesman, predating BASIC and Pascal. SNOBOL4 first emerged at Bell Labs in 1962, when three researchers used an IBM mainframe for solving complex equations as they analyzed the long-distance network. They weren't professional programmers. When they used the languages at hand, they spent more time fighting with its syntax and coding instructions than they spent on their real business.

They wanted a simple language that would allow them to focus on the problems before them, rather than on writing code. There wasn't such a language, so they invented one—SNOBOL, which supposedly stands for StriNg-Oriented symBOlic Language. It gained immediate popularity throughout Bell Labs, and spread to the academic and research communities.

Users requested new features, so improved versions became SNOBOL2 and SNOBOL3 before being standardized as SNOBOL4 in 1967. At universities with mainframe and minicomputers, SNOBOL4 had become popular a decade ago, both as a language to learn in programming classes, and as a language to employ for research, especially textual research. But SNOBOL4 missed the personal computer revolution because it requires more RAM than the 64K maximum on early personal computers.

Now that 256K is pretty well the minimum on a desktop machine, you won't have any trouble running SNOBOL4. But what do you do with it?

Let's start with strings. SNOBOL4 is almost unique among programming languages because it can handle an entire string with one statement.

Here's a simple exercise: Given a line of text, convert all its lowercase characters to capital letters, and display the result. BASIC is alleged to work well with strings, but here's what you have to do in BASIC.

To perform a simple string exercise in BASIC, you had to chop the string into individual characters. Then each character had to be converted into a number. The number was checked against the ASCII table, and if the number fell within a certain range, then 32 was subtracted from the number. After that, the numbers were converted back into characters, and reassembled into a new string. You go through pretty much the same process in most other programming languages.

That's a lot of work when you compare that to the simple SNOBOL4 program, which handled the entire string in one statement without having to chop it into individual bytes. And notice that SNOBOL4 handled a string operation as a string operation—the letters did not have to be converted into numbers, and then back into letters.

The REPLACE function works the way its name implies. If the statement is REPLACE(String1,String2,String3), it means that every time a character in String2 is found in String1, replace it with the corresponding character in String3. Strings can extend up to 32K bytes in the MSDOS implementations of SNOBOL4, which means that a short, simple program can massage a lot of text.

For example, WordStar often adds 128 to the ASCII value of characters in its files. The last letter of each word gets that treatment, as do certain carriage returns and the like. Converting a WordStar file to a straight ASCII file is quite simple in SNOBOL4. Once the input and output have been defined, which can be done internally or on the DOS command line, the core of the program looks like this:

```
&ALPHABET LEN(128) . ASCII LEN(128) .
HIBITS OUTPUT = REPLACE
(INPUT,HIBITS,ASCII)
```

Keywords in SNOBOL4 start with ampersands, and &ALPHABET means the entire character set. The LEN(128) means to start at the

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```
10 TEXT$ = "Convert all letters to upper-case."
20 FOR A%=1 TO LEN(TEXT$)
30   B%=ASC(MID$(TEXT$,A%,1))
40   IF B%>97 OR B%<122 THEN B%=B%-32
50   NEWTEXT$=NEWTEXT$+CHR$(B%)
60 NEXT A%
70 TEXT$=NEWTEXT$
80 NEWTEXT$=""
90 PRINT TEXT$

To do the same thing in SNOBOL4, here's the program:

UPPERS = 'ABCDEFGHIJKLMNOPQRSTUVWXYZ'
LOWERS = 'abcdefghijklmnopqrstuvwxyz'
TEXT = 'Convert all letters to upper-case.'
TEXT = REPLACE(TEXT,LOWERS,UPPERS)
OUTPUT = TEXT
```

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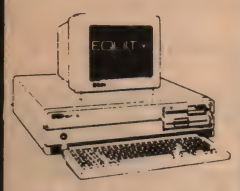

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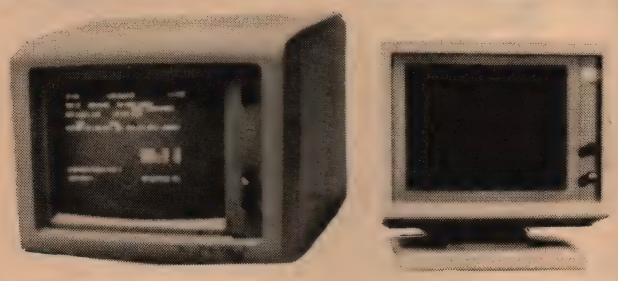

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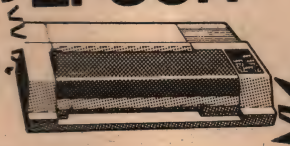

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SNOBOL4
continued from page 175

beginning and go 128 characters. The period is the left-to-right assignment operator in SNOBOL4, so the first 128 characters are assigned to the variable named ASCII. And obviously, the next 128 characters are assigned to the variable HIBITS. After that, it's just replacing all those HIBITS with their corresponding ASCII characters. If this were put into a loop, it would be a complete program.

That shows how easy it is to work on strings with SNOBOL4. The language has a simple syntax, too. Comment lines start with an asterisk. Program statements have three components, and look like this:

```
LABEL  OPERATION          :(GOTO)
```

A statement can have one component, two, or all three.

Looking on the right side first, there's the GOTO, which passes program control to the LABEL referenced in the GOTO. A GOTO starts with a colon, with the label name in parentheses. When there is no GOTO, then the program proceeds to the next statement.

The GOTO above is unconditional. There are also conditional GOTOs in SNOBOL4, but to see how those work, you need to know about "success" and "failure." In the SNOBOL4 environment, success is not something you dress for, but one result of an operation.

Let's look at a simple program. We have a list of words, which we can assign to program input from the DOS command line. We want to find out how many of them have a "t" in them; we'll store that total in a variable called TCOUNT. Here's the program: See Example 2.

```
          &ANCHOR = 0
GETWORD   WORD = INPUT                    :F(SHOW)
          WORD ? 't'                      :F(GETWORD)
          TCOUNT = TCOUNT + 1             :(GETWORD)
SHOW      OUTPUT = TCOUNT " words have a t."
END
```

Example 2

```
          &ANCHOR = 1
          PAT = ('th' | 'ch') ANY('aeiou') RTAB(1) 'g'
GETWORD   WORD = INPUT                    :F(SHOW)
          WORD ? PAT                      :F(GETWORD)
          PCOUNT = PCOUNT + 1             :(GETWORD)
SHOW      OUTPUT = PCOUNT " words fit the pattern."
END
```

Example 3

The first statement sets the keyword &ANCHOR to 0, so that SNOBOL4 will look everywhere when it tries to match a pattern. In the case above, the words "this" and "stop" would both match the pattern, because both contain a "t."

If &ANCHOR is set to 1, then SNOBOL4 will look only at the beginning for a match. So "this" would match because it starts with a "t" but, "stop" would not match because its "t" is not in the beginning.

The next line starts with the label GETWORD. Then WORD is made equal to INPUT. The GOTO here is conditional. The "F" means that if the statement fails—that is, if the program runs out of input—then control goes to SHOW. Otherwise, the program goes to the next line.

Translated into English, the next line says "Does this word contain the letter t? If it doesn't, then this statement fails, and we go back up to GETWORD to try again. If it has a t, then we just go on to the next line."

After that, the counter is incremented, and an unconditional GOTO takes control back up to GETWORD.

Once all the words have been read, the program goes to SHOW, where the screen will display something like "67 words have a t." Note that the space is the concatenation operator in SNOBOL4. In BASIC, you'd have to do something like BIG$ = LEFT$ + RIGHT$, and in C, you'd have to merge two arrays, but in SNOBOL4, it's as easy as putting one word after another.

After that is END, which is just what it sounds like.

Asking whether a word contains a "t" is so simple in SNOBOL4 that it hardly demonstrates the language's power with patterns. Suppose we wanted to find all the words which start with "th" or "ch" followed by a vowel, with a "g" as the last letter.

To do that, we'd define a pattern, then check the words against the pattern, like this: See Example 3.

Just think of writing that in any other programming language, let alone writing it in only seven lines. For another demonstration of SNOBOL4's simplicity and power, let's try a word-frequency table. Given an ASCII text file, we want to find out how many times the word, "'a" appears, how many times "computer" appears, and so forth. The words ought to be sorted so the most-used words appear first.

Doing this in BASIC takes about 60 statements; Turbo Pascal requires 120, and C takes pages and pages of code. Here's the entire SNOBOL4 program: See Example 4 on page 179.

After the keywords are set and the strings are defined here, there's a pattern, WORDPAT, which uses two SNOBOL4 functions, BREAK and SPAN. Here, BREAK passes over anything that is not in LOWERS, and SPAN matches any series of LOWERS, which is then assigned to WORD. Then comes the definition of TALLY as a table.

The process starts with GETLINE, which reads the input and normalizes the line to lowercase letters, since for our purposes, "Shopper" and "shopper" are the same.

GETWORD chops the words out of the line, using WORDPAT. Once the words are pulled out, they are placed on a table. A SNOBOL4 table resembles a conventional array, except that the index on a table can be any sort of variable. In BASIC, for instance, you could have the variable A(6), but not A(6.3) or A("what"). In this table, the index is the word, which points to how many times the program has encountered the word.

The first time the program encounters "computer," the variable TALLY["computer"] equals 1. The next time, TALLY["computer"] gets in-

continued on page 179

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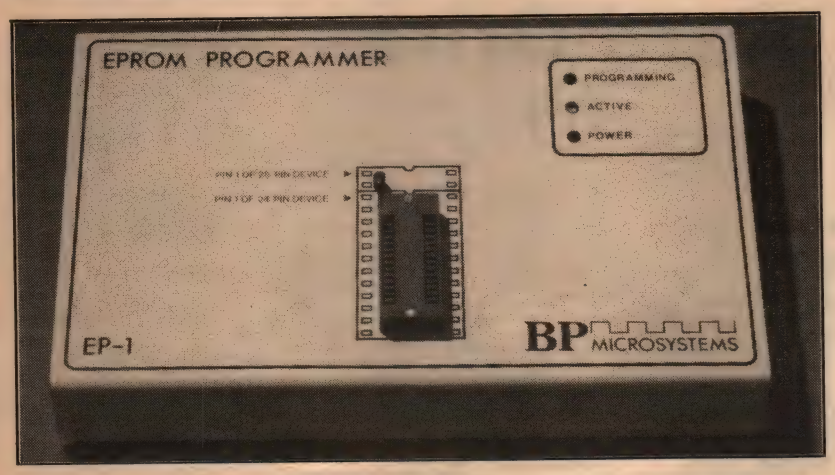

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SNOBOL4
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cremented to 2, and so forth.

After the words have been counted, they need to be sorted; SNOBOL4 has a built-in SORT function, as well as a reverse sort, called RSORT, which is used here because we want the biggest numbers to come first. RSORT produces a conventional two-dimensional array, which the program then steps through and displays. The output could be sent to the printer or a disk file by adding a line to the program, or by specifying the output on the command line when SNOBOL4 is invoked.

To run a SNOBOL4 program from the DOS prompt, with input from a file called INFILE.IN and output going to the printer, you'd enter something like this:

```
A> SNOBOL4 PROGRAM /I=B:INFILE.IN
   /O=PRN:
```

Source-code files for SNOBOL4 have the extension ".SNO" and are created with any text editor that can produce straight ASCII files. SNOBOL4 is a hybrid between an interpreter and a compiler—the source code is first compiled into a compact binary format, and the binary code is then interpreted and executed.

This has barely touched the surface of a rich general-purpose language. It's an excellent tool for reformatting files created by one word processor so that another one can handle them.

I use short SNOBOL4 programs almost daily for this, because I often work with people who use different word processors. In seconds, a WordStar file becomes a MicroSoft Word file, or a PC-Write file, or a SuperWriter file, or vice-versa. We can all exchange work easily, and none of us has to go to the trouble of learning a new text editor.

Every week, I send a column via modem to a metropolitan newspaper, whose computer is quite picky about how files come in. It used to take me 20 or 30 minutes to reformat a WordStar file and insert all the correct codes for a 750-word column; a SNOBOL4 program does it all in less than four seconds, and it took only an hour or two to write.

The pattern-matching power makes SNOBOL4 a sophisticated language for database management; a hospital in Texas uses it to match patient symptoms with prescription drugs. Not only do patients recover more quickly, but they're saving more than $100,000 a year by reducing unneeded prescriptions.

People use SNOBOL4 for natural-language translation, text analysis, code-breaking, hyphenation and justification for typesetting machines, and computer-created original poetry—among other things.

There are about as many uses for SNOBOL4 as there are users of SNOBOL4, who can get fairly passionate when their favorite language is attacked by certain purists from the Cult of Structured Programming. SNOBOL4, after all, employs the diabolical GOTO.

To sneer at SNOBOL4 on that account is to miss the point of structured programming. The machines don't care—the structure is to make it easier for us humans to write, debug, and maintain programs. SNOBOL4 certainly doesn't keep you from writing structured programs; in fact, it's easy to structure your own programs because SNOBOL4

continued on page 180

```
          &ANCHOR = 1
          &TRIM = 1
          LOWERS = 'abcdefghijklmnopqrstuvwxyz'
          UPPERS = 'ABCDEFGHIJKLMNOPQRSTUVWXYZ'
          WORDPAT = BREAK(LOWERS) SPAN(LOWERS) . WORD
          TALLY = TABLE()
GETLINE   LINE = REPLACE(INPUT,UPPERS,LOWERS)        :F(SORT)
GETWORD   LINE WORDPAT =                             :F(GETLINE)
          TALLY[WORD] = TALLY[WORD] + 1              :(GETWORD)
SORT      RESULT = RSORT(TALLY,2)
          I = 1
SHOW      OUTPUT = RESULT[I,1] ' - ' RESULT[I,2]     :F(END)
          I = I + 1                                  :(SHOW)
END
```

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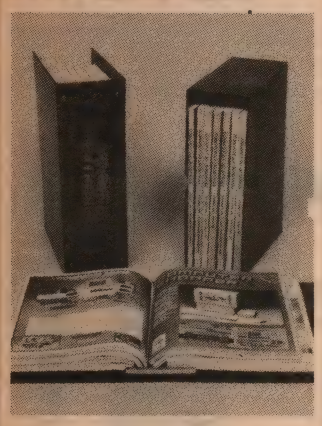

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SNAP: Not Just Another Pretty Interface

by Wayne A. Yacco

SNAP is a comprehensive, menu-driven system manager for the IBM PC/XT/AT compatibles. It manages the entire system including file management for the, required, hard disk. Over one-hundred functions are included and the program allows you to design an unlimited number of additional menus. Networks are supported.

There are a seemingly infinite number of programs that insulate the user from the PC's DOS operating system. These DOS-shell programs all claim to free one from learning complicated command syntax through the use of menus. Need one not learn to use the menus? It is not in my best interest to believe in these programs whatever the validity of their claims. After all, I write a monthly column on DOS that depends, to a certain extent, on the continuation of the command line.

A number of sources had told me that SNAP was an exceptional product and, supposedly, the testimonials from corporate users were exuberantly enthusiastic. So, it was with some trepidation that I agreed to examine SNAP. I firmly planted my mental feet and began my evaluation resolved to maintain my opinion that programs of this type just add another unnecessary level of complexity.

The publisher's cover letter began with a standard claim that SNAP deletes the DOS prompt and commands. It went one step further and promised to eliminate all the training addition.

A slogan on the cover of the manual temporarily caught my eye. It said "The Power Will Shock You." Then I noticed that the manual was a relatively hefty book of over 70 pages, not the pamphlet that I was expecting. It was the very first page of the manual that began to cast some doubt on my prejudices. The Mt. Whitney Group guarantees, actually Guarantees, that SNAP will perform all of its features. My reading continued with the first few pages.

I decided to test the program without reading the manual any further. That can't be done with DOS, after all, but it appealed to me as a fair test for

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SNOBOL4

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allows you to define your own functions, if the hundred or so that come with the language aren't enough.

SNOBOL4 also keeps track of variable types for you—no declarations are necessary, and very seldom do you have to worry about whether you're dealing with a string or an integer. SNOBOL4 will convert variables automatically; if you ask for the result of "123" + 6.3, you'll get 129.3, instead of an error message.

Such flexibility extends much further. You can define your own data types and structures and even redefine the operators. Since code is generated at runtime, you can build programs that modify themselves.

Programs in SNOBOL4 tend to be short, as evidenced by the word-frequence program. Which is easier to write, debug and maintain? Fourteen lines of SNOBOL4, 120 lines of Pascal, or six pages of C? No matter how well the lengthy and tedious code is structured, to ask such a question is to answer it.

Besides all that, SNOBOL4 is just plain fun. Its tables allow for true associative programming. You can keep your mind on the problem you're trying to solve with your program, rather than on the intricacies of writing code.

One of SNOBOL4's creators, Dr. Ralph Griswold, now at the University of Arizona, explains that, "the user of the language should not have to worry about how the computation is performed or what the actual implementation details are, but instead should be able to concentrate on the solution of problems. Without question, this philosophy was carried to the extreme in SNOBOL."

If you want to concentrate on solving problems with your personal computer, there are two implements of SNOBOL4 that will run on any MSDOS computer—it doesn't have to be a clone or compatible. Both have received good reviews, and are available at some retailers and from mail-order houses that specialize in languages. They are also sold directly, and both companies accept telephone charge-card orders.

Minnesota SNOBOL4 from Berstis International costs $44.95 for the diskette with the language and several sample programs; this also includes a 56-page reference manual. It is the slower of the two implementations, and will not work on real numbers without an 8087 co-processor. The company is at P.O. Box 441, Millwood, NY 10546, telephone 914-271-5855.

SNOBOL4+ from Catspaw, Inc., cost $95, but has dozens of extended features as well as a 240-page tutorial and reference manual. It will handle real numbers on a stock PC, and SNOBOL4+ offers a runtime module which can be freely distributed. Catspaw issues a quarterly newsletter and runs an electronic bulletin board (300-1200-2400 bps; 303-539-4830); it sells, by mail order, all SNOBOL4 books in print. The company is at P.O. Box 1123, Salida, CO 81201; telephone 303-539-3884. ●

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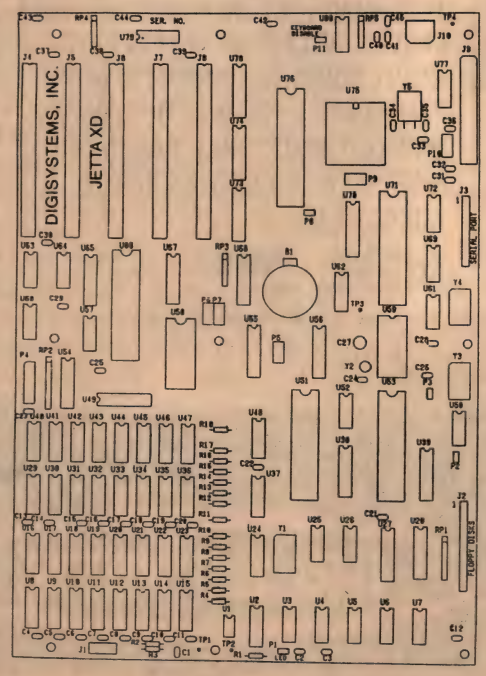

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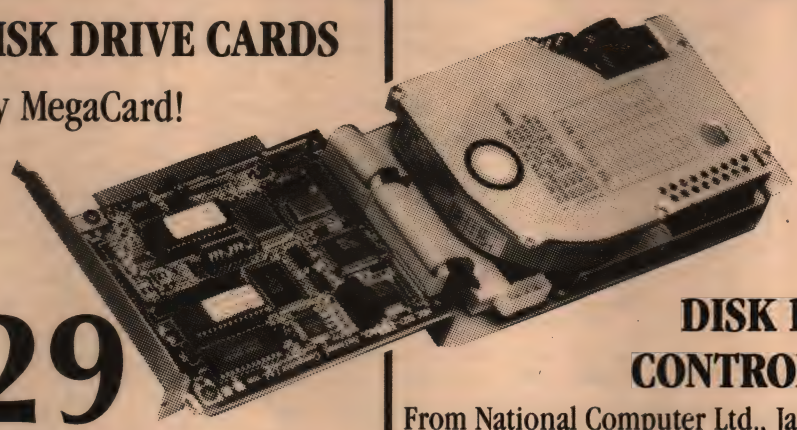

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SNAP
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Mt. Whitney's boast about training requirements. The following discoveries are the result of my experimentation; some good, some bad. Let's begin with the disappointments.

The first thing you are confronted with, when you load SNAP, is the installation program. It is nicely done with one or two, almost trivial, exceptions. Some users object to programs that modify their AUTOEXEC.BAT file without giving an option to omit the changes. Fortunately, the changes that were made were minor, easily detected, and convenient for an experienced user to remove. Unfortunately, some free support, on its toll-free support line, with each they might not be understood, by the inexperienced user that the product is targeted for, if that user wants to uninstall the product or run it as a utility rather than as a shell. So, what the clever folks at the Mt. Whitney Group have done is saved a backup copy, called AUTOEXEC.BAK, that can be restored as the autoexec file.

A second problem, the user may encounter, occurs if you don't follow one of the installation instructions very carefully. When asked to strike the ENTER key, to continue, I foolishly typed ESCape instead. At that point, Rodney Dangerfield jumped out of my drive, pulled Vinnie Boombah off the diskette, and had him BREAK my knees for failing to pay proper respect to the software. It seemed like an overreaction. Please, give me a break, don't give me a BREAK. My second effort was flawless but it had required an unnecessary cold boot to recover from that one keystroke.

When software beats up on me, I like to be able to call for help. Mt. Whitney includes copy of the product. Calling that number can quickly provide a solution for most problems.

Once the installation has been completed, the user finds (her) himself in SNAP each time the system is loaded. The menu system is intuitive, but it simply is not possible to determine what functions are in each selection without using the help screens or learning the system. So, as to the question of being free of training requirements, this is true only if one pauses for the extra step of reading the help screens. The help screens are a big plus for the infrequent user but a heavy PC addict will probably do as well on straight DOS, reserving this program as a utility.

COMMAND.COM is still faster for the most frequently performed operations because the user doesn't have to move between, or scroll through, menus. The busy manager or executive, with occasional PC-based information needs, may find that SNAP does eliminate training in that specific situation.

The function "Learn DOS commands" furnished the greatest disappointment. It is rife with minor inaccuracies and omissions which adulterate its potential. Even though most DOS commands were adequately served, and some, like prompt, were admirably executed, this feature definitely needs some improvement. The following list corrects the most egregious flaws.

ATTRIB is incorrectly designated as a 3.2 command when it has only been enhanced for 3.2. While it is true that the presented syntax is rightfully 3.2, the command itself is not. The given tutorial is inappropriate for 3.1 but could have been properly explained for both DOS versions with little effort.

The tutorial for the COPY command was accurate but limited to the most basic functions. There are some advanced capabilities, that the DOS manual does a poor job of clarifying, which could be profitably explored if another page or two were available for this command. The design of the program apparently makes it difficult to provide multiple

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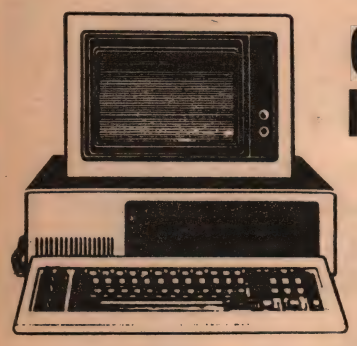

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Line Numbering Of WordStar Document Files

by Joseph E. Laferriere

The advent of the personal computer has caused many changes in the way scientists do their work. In particular, word processing programs have tremendously increased the productivity of researchers and freed them and their secretaries from the drudgery of typing and retyping rough drafts of their articles. The new technology can, however, lead to new problems which require innovative new solutions.

Many scientific journals request that articles submitted for publication have the lines on each page numbered. This can be cumbersome and time-consuming on the word processor, since WordStar (one of the most widely-used word-processing programs) and most similar systems automatically reform paragraphs, which can place the numbers in the middle of lines unless this numbering is the last stage in the preparation of the manuscript. Even so, the numbers must frequently be inserted manually before the final copy can be printed.

The following program will number all the lines in a WordStar document file except those containing dot commands and reset the counter to 1 at the top of each page. It will leave four spaces between the number and the beginning of the line if the number is less than nine, three spaces if the number is 10 or greater. These figures can be changed by altering the number "4" in line 20 to equal the number of spaces you would like to remain after the one-digit numbers.

To use the program, I recommend that you make your WordStar document approximately 5 characters narrower than you wish the page to be printed. This can be done

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Line Numbering
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by using OR to reset the right margin and QQ B1 to reformat all the paragraphs in the file. If you compile the program, you can run it directly from the WordStar Opening Menu by selecting "R"; otherwise exit from WordStar, swap your WordStar disk for your BASIC disk, and enter BASIC "LINNUM." The program will then ask you for the names of the old file and the new one you are about to create (these should not be the same). It will then proceed to create a new file which is identical to the old one except that its lines will be numbered in sequential order. You may then return to WordStar and print the file as you normally would do. Inserting the line numbers should be the very last stage in editing the document; if revisions are necessary it may be easier to make the changes in your original file and rerun the LINNUM program.

Understanding how this program works requires some knowledge of how WordStar makes document files. WordStar changes the last letter of each word into one of the upper level graphics characters by turning on the highest bit of the letter's binary code (i.e. by adding 128 to the ASCII number). This is why a WordStar file contains graphics characters if you TYPE it directly from MSDOS. These flags are used by the program in paragraph formatting. Hard carriage returns (ones entered by the user) are represented by character 13 (carriage return) followed by character 10 (line feed); soft returns (ones entered by WordStar during paragraph justification) by character 141 plus character 10. If either of these come at the end of a page, character 138 is used in place of character 10.

This program inputs characters one at a time from the file, searching for either character 10 or character 138. If the first character thereafter is anything other than a period, the program either increments the counter or resets it to one, depending on whether the new line starts a new page. This is accomplished using the command N = 1-N*(C<>CHR$-(138)). BASIC's STR$ command, which is used to tack the number onto the beginning of the line, inserts an extra space before and after the number; the command A = MID$(A,2) removes the extraneous byte from the beginning of the line.

The program takes a few minutes to run, especially on long files, but is much less time-consuming and less aggravating then trying to enter the numbers manually. Similar programs could certainly be designed for other word-processing programs with a little experimentation. ●

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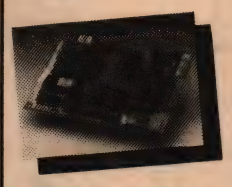

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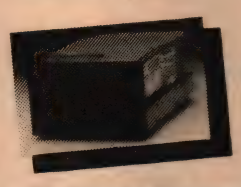

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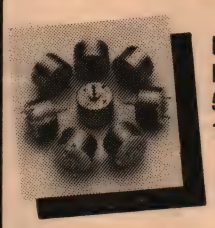

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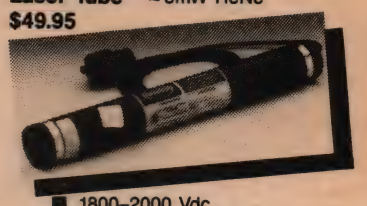

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pages for a single menu entry, and that is understandable, but wouldn't it be possible to have more than a single entry for this complicated function—say COPY I, COPY II, etc.

Not all versions of the DEL command function as described when the parameter list is omitted. In PC DOS 3.1, omitting a parameter list displays an error message and does not delete the entire current directory. Exhaustively testing every version of DOS is beyond the scope of this review, but Mt. Whitney certainly might find it to be a reasonable undertaking for such critical commands as DEL, SYS, FDISK, and FORMAT.

The default DOS shell, COMMAND.COM, should have been included with its allowable parameters: the 3.2 enhancements and the earlier /c and /p switches. There are several other omissions including the FDISK, SELECT, and SHELL commands, the 3.1 JOIN command, and the 3.2 STACKS command.

SUBST's entry would be more complete if it included a notice that the command is intended to be used with software that does not support paths. Novice users may not consider this as a possibility otherwise.

The claim made for the VERIFY command's ability to confirm that data are written correctly is slightly misleading. The explanation of how this is accomplished through a CRC test properly identifies what the command actually does, it verifies the bit count of the data. To verify, with greater reliability, that compensating errors have not fooled the CRC (a very improbable occurrence but one that will happen occasionally), it is necessary to use COMP.

It seems to me that, while a complete explanation of MODE is legitimately beyond the scope of this feature, a list of parameters could have been included for the sake of users who need only a quick reference.

ANSI.SYS, VDISK.SYS, AND DRIVER.SYS could also have been given brief descriptive entries similar to the way the MODE command has been handled. CONFIG.SYS commands were all omitted from the list of DOS commands but could have been justifiably included as they are on a printed, DOS quick-reference card.

While the forgoing seems to be a condemnation of the Learning function, it is not intended to be. It is almost complete as a casual reference but it may not be suitable in all circumstances that call for precise knowledge. If you need precise information, refer to the DOS manual, at least until a new release solves these problems.

Fortunately, the Learning function is only a small part of the utility system. Many of the features offered by this program are also available from the operating system but SNAP provides them through its own menu-driven interface. These functions include FORMAT, DISKCOPY, BACKUP, and RESTORE in addition to numerous subfunctions of other features.

For the experienced user, much of SNAP's value comes from its extensions of DOS. Improvements have been made to some of the familiar commands. The FORMAT function, for example, will not format a hard disk, accidentally or otherwise—a good feature. The largest part of this shell's arsenal is not available through the operating system at all.

SNAP adds many important features to DOS. There is no question that, for those times when it is necessary to successively perform numerous file maintenance functions, SNAP will be far more efficient than DOS. The user can, using the "Directory/File Maintenance" feature, simply round up a group of files and delete, copy, or move them as a unit.

Recovery of erased files is at least an order of magnitude easier to accomplish than with the Norton Utilities 3.0. It is just one key to select the function, another to position the cursor, and a third to key the first letter or the file name. Fast!

The concept of file recovery was pioneered by Peter Norton but he is suffering the fate of many trailblazers. His imitators are building resorts along the path he carved from the wilderness.

The function "View/Print Directory Tree" adds, to the DOS tree command, the ability to enter any of the directories and view all of its entries. When the cursor is on a directory entry, transferring to the file-maintenance function requires only a single press of the ENTER key.

SNAP has a very practical layout for the files displayed for maintenance, placing them side by side, five up, across the screen. This maximizes the number that can be seen at one time. While the maintenance display makes use of the screen's full width, to improve over DOS's display of files, the directory tree uses only the left margin of the screen. It's a little early to formulate a wish list for this product but a serpentine tree might eventually find its place on one.

Attributes are displayed, and may be modified, for each entry when the cursor moves to it. As the cursor selects each entry, file size is displayed in a special box at the bottom of the display. The creation date is not displayed; instead, the current day's date is constantly displayed. Since the current date is available on other menus, this seems to be a poor utilization of screen real estate. It is possible to examine and sort on date, time and file size in the "Print/Sort/Display Directory" function, but not to manipulate the files on those criteria. Therefore, some applications will still require the power of the DOS XCOPY command.

SNAP includes a good built-in editor. SEDIT, is substantially more powerful than EDLIN although the configuration menu (which is always available) allows any other editor or word processor to be substituted for it. This default editor is very similar to the note pad in Borland's Sidekick, it shares the use of Wordstar's control diamond but lacks Sidekick's ability to customize or take advantage of the PC's cursor pad.

Most features you need in an editor are present. There is an autoindent feature, reformatting, wordwrap, block commands, error recovery (undo), the ability to imbed printer-control commands, nine markers that can be jumped to, and nine linkable windows.

Searching for lost files is another of SNAP's extensions. It allows the user to specify a

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It's Leading Edge WP For Me!

by Charles Mills

"You use what?" His eyes search mine trying to decipher the joke that must be hiding my last statement.

I clear my throat and try again. "I said I use the Leading Edge Word Processing program that came with my Model D computer. It's great—has everything I need!"

"Come with me." He grabs my arm and hurries me toward a door at the far end of the hall. I smile at the people we pass. His grip tightens. My arm begins to hurt.

Once inside the cloistered confines of his office, he turns to face me, eyes slightly bulged.

"We don't say things like that here!" His voice trembles with emotion. "We only say 'Wordstar,' or 'Wordperfect,' or maybe 'Microsoft Word,' but never...never..."

"Leading Edge?"

"Yes!" He sits down heavily in his chair and pulls a bottle of antacid from the desk drawer. "You can get in big trouble saying such things."

Next to him, an XT hums in the heavy silence, its screen filled with columns of control commands, its keyboard surrounded by plastic templates.

"How long has this been going on?" he asks.

I think back over the months to the day my new computer arrived.

D-Day

My search had finally ended. Before me, pristine in its 384K (expanded), 20mb beauty, sat my Model D. Eagerly, I removed the shrink-wrap from the Leading Edge Word Processing manual and software. I loaded the disks into my Seagate.

What' this? I look closely at the image. No control key combinations, no secret codes to break? Everything's in plain, everyday, layman's English. I move the reverse video light bar over the menu selections using the cursor control keys. Edit, Print, Create, Delete, Copy, Rename, Move, Archive, Folder, Utilities. At each stop, a short message appears at the bottom left hand corner of the screen defining what each selection will accomplish. This is great!

It Begins

I choose CREATE and press execute. "Enter Document name" I'm prompted. "Fantastic Article" I type.

The little red light on the hard disk flickers. Along the top of the screen a dotted format line materializes indicating margins and tab settings. Just above it to the left, sits the time, date, and name of my article. To the right, page, line and cursor position numbers keep track of movements around the document.

As the manuscript grows, I use the Delete, and Back Space keys to remove typos. For bigger erasures, the manual instructs me to press Shift and Delete. After highlighting, errant lines, paragraphs, pages vanish. The computer keeps 255 characters of the last deletion in memory just in case I change my mind and want them back on screen. I can overtype or insert my words at the toggle of a key.

For emphasis, I underline (on screen). When I really want to get attention I double underline, type bold, double-wide bold, or italic, all using a simple highlighting routine intitiated by a function key.

Function Key Power

Leading Edge makes good use of function keys. F1 provides on-screen help for procedure questions. F2 totes tab and decimal commands. F3 directs setting (or resetting any place on the document) the format margins, line spacing, and security adjustments. F4 supplies indent commands. F5 brings up the attribute menu for underline, bold, sub and super script, over strike, font and color features.

Each function key menu (except F1) appears across the top of the screen. My document never disappears. The menus instruct with words, not symbols, how to exploit the program's bells and whistles.

F6 centers or puts words flush against the right margin. F7 lets me search for certain words or phrases throughout the entire manuscript. I can also search and then replace words or groups of words. F8 inserts page breaks automatically or allows me to position them where I think they should be. Pages number in proper sequence. Widow and orphan settings help determine the look of the manuscript. F9 cuts, F10 pastes. By adding Shift to F9 and F10 I store "named cuts" for later use as "named pastes."

I add headers and footers. "Fantastic Article" nears completion.

Spelling Check

With two keystrokes I GOTO page one. Pressing CTRL and F7 loads the 80,000 word Leading Edge spelling dictionary (based on Proximity/Merriam-Webster Linguibase software). Finding a misspell, it prompts with some samples of how it thinks I meant to spell the word. I can accept one of its suggestions, or add the word as I have it, to the "user dictionary."

"Now comes the hard part," I think to myself. "To save 'Fantastic Article,' I have to come up with some computer language name so my disk will recognize it next time I want to find it, right?"

Wrong!

Leading Edge saves the file automatically, every time the keyboard is still for 15 seconds. Not only that, my article will be listed in the document directory by the complete name I gave it to begin with (up to 30 characters long). Leading Edge also assigns the manuscript a DOS file name (with extension .DOC) and saves it in the word processing sub-directory.

The Utility feature converts a copy of the document to ASCII for use in other application programs. It will also import other ASCII files into the document format, ready to be edited.

I Archive (copy) my manuscript to a floppy for backup. The word processor guides each step of the way.

Drawers and Folders

"Easy" best describes the program's filing system. Each disk (hard or floppy) is a Drawer. In the Drawer are Folders. In the Folders are Documents. My "Fantastic Article" resides in the "Article" folder of Drawer C (my Seagate). A drawer can have up to 32 Folders—Correspondence, Scripts, Research, Contracts, Poems, Song Lyrics—the Folder Directory lists them all. When I "open" a folder by choosing it with the on-screen reverse video light bar and pressing execute, a list of all current Documents in that folder appears. I simply "open" the document, and I'm in the writing or editing business. And I haven't spoken "computer" at all.

The detailed User's Guide shows how to create macros, although I've found Leading

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SNAP
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path and file name. The search is then conducted in the directory, and in all of its subdirectories, for the file named in the path. Matches are displayed in the window but again, incredibly, without the date.

After you have your list of matches, you may choose to use the high-speed viewing capability of the maintenance facility. Viewing speed can be selected from nine levels to quickly determine which version of a file is at hand or to slowly review its details.

The system-information feature provides practically every conceivable specification of the hardware. There did seem to be some difficulty with the report of installed physical memory but everything else was accurate in great detail. Every disk drive, RAMdisks included, was completely described—storage capacity, sector size, cluster size, timings and so forth. It even correctly identified the amount of emulated EMS memory provided by my Above Disk software.

Other functions include global file deletion: the ability to delete a file everywhere it appears on a disk. (Again, in the latest release, the hard disk is protected from universal deletion by wildcards *.*.) Subdirectories can be renamed as easily as a file. The MOVE subfunction in file maintenance will move files nondestructively—without overwriting another file, of the same name, in the target directory. Encryption of files is provided as are three levels of password security. There is also a screen blanking function. And the list goes on and on.

Learning and using SNAP, as an occasional utility, is facilitated by its concise help screens. Wherever the cursor is, just strike F1 and the appropriate window opens to explain what functions are availble or what response is required. It, almost, never seemed to fail to provide the appropriate information.

Perhaps the help facility was designed by the same writers who did the excellent manual. Although I began using SNAP successfully after reading very little of it, it was necessary to return to the manual to evaluate it and to discover any features that might have been overlooked. This well-written document is very thorough, beginning with a clear, reflexive explanation of how to read and use it. The novice user will find that it provides not only the required reference to the product but also many insights into the operating system that are especially useful. It also explains how the user can define, or add items to, custom menus.

Menus can be employed to run jobs. The manual suggests that SNAP's menus be used to completely replace batch files. They can be quite powerful. Their creation is one function that requires more training than the help screens can provide. Having learned the procedures from the manual, the help facility is a useful quick reference.

Using the menus to replace batch files has a significant advantage for conserving disk storage. All of the menus are saved in the same disk file, virtually eliminating the substantial cluster slack that typically accompanies large numbers of batch files.

In part, the decision to use an interface depends on certain fixed and variable costs. The costs associated with using a menu-driven interface include familiarization with the location of functions in the menus, traversing nested menus, and cursor movement.

SNAP has addressed the issue of cursor movement by adopting a method similar to that popularized by Lotus 1,2,3. The menu items can be selected by cursor movement or by keying their initial letter. They can, alternatively, be organized with letter prefixes that may be keyed.

Whether or not the costs are worthwhile, for a given user, may depend on whether that user will work with a computer frequently enough to allow learning and retaining command syntax.

There is no doubt that SNAP can offer a lot to any user, including those with familiarity with DOS.

It offers plenty of bang for a buck with a price point of $99.95. If the claims are true, that's less than a dollar perfunction.

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Confessions of a Low Level Formatter

by Harvey S. Laidman

It diminished. On Halloween there were 3 megabytes left. By Thanksgiving, there was less than a megabyte. The prospect of opening another 100K account file in Dollars and Sense on January First was approaching rapidly. Late in the evening, I cruised the directories. What could be deleted?

The axe swung. Every setup file, every unused printer driver fell. Fastback's 100K list hit the substrates with a resounding thump! I had recovered 256K.

Thirty megabytes seemed like more than I'd ever use when I purchased the Compaq 286. After all, a hard disk that added two or three grand to the price of a computer just had to be enough. Coming from the rough and tumble world of Z-80s and CP/M; 64K and 315K disks held a world of storage. Then there was Framework. And Symphony. And Windows.

My hand strained on the telephone. Always reluctant to call my dealer. I feel like a really insignificant fish. Where do I stand among all those big network customers with multiple orders for hundreds of thou? I ordered memory boards, carrying cases, etc. for my Compaqs. I always had to keep reminding them; I gave up on most of the orders. Small fish have small voice. I tried them anyway. For about five grand I could have the official seventy megabyte Compaq hard disk. Someday. Sometime. Somewhere. My thousand dollar deposit cheerfully accepted.

In the gossamer pages of the computer magazines ads for seventy megabyte hard disks glowed. They were around a thousand dollars. Would one of these work in my Compaq?

My hand strained on the telephone. The mighty giant of Texas, Compaq, was always cool and condescending on the phone.

"Absolutely no other drive will work in the Compaq, suh," the cool, condescending, lilting southern voice said.

Okay. Compaq has some kind of unusual deal in this machine. But what could it be? They're so completely compatible. No. It can't be.

"I see absolutely no reason why our seventy-megabyte hard disk shouldn't work in the Compaq 286," said the friendly voice from Omaha. "I once spoke to someone at Compaq. Lemme see. Oh, yes. Morris Clevenger. (The name, Morris Clevenger is made-up. There is no such guy at Compaq. Not only that, but I haven't even mentioned the good guys who helped me because I don't think they'd appreciate a zillion phone calls.) Try him."

"Morris Clevenger, please?" I held my breath as the extension rang. The woman who answered was not Morris Clevenger.

"Morris Clevenger's office."

"I'd like to speak to Mr. Clevenger."

What about?"

"I'd like some information about a hard disk for my Compaq 286."

"We don't give that kind of information out."

"I'd just like to know what number an eight-head, 1024 cylinder drive is on the set-up menu?"

"We can't give you that information."

"Why?"

"It's internal company proprietary information."

"The drive table is an industrial secret?"

"Well...yes."

"And you're afraid I'm an industrial spy?"

"Sir, Mr. Clevenger is a very busy man."

"Click."

We small fish are never busy. We're industrial spies.

"It's number four." Said the voice from San Diego. It only took one call. Software developers have to know. I purchased his software. It was a small price to pay to be acquitted.

Wait a minute! What do I do now with this deluxe two-thousand dollar 30 megabyte drive that's in the Compaq?

I'll stuff it in my son's PC. That's what I'll do.

Not much information on it. What's this label? It says: "Especially configured for the Compaq 286."

I do have a little experience with Western Digital controllers. They're very good, and there's a ROM program for formatting drives.

"Enter the interleave factor."

"Enter the rotational latency cylinder."

"Enter the eggplant reverse toenail equation."

You get the idea.

I'll just pick up the phone and call my old pal Mo Clevenger at Compaq. He'll give me all the dope on the 30 megabyte drive. And the Pope is a Hindu.

"Gotta pencil?" I imagined the San Diegan in shirt sleeves and visor, bent over a paper-infested desk. He rattled off the numbers.

continued on page 190

continued from page 186

Edge to be simple and efficient enough without them.

Each Folder contains a dynamite feature that I use continually. It goes by the name Standard Document.

Each time a Document is created, the Standard Document, of that particular folder, formats it after itself. Now, each new document in my "Article" Folder opens, adorned with my name, address, copyright notice, and rights for sale information.

If I need to transfer information from one document to another, I start the procedure with the window command.

The screen splits into two sections. My current work occupies the top half. Waiting in the bottom half sits the other document I chose. I then name cut, Switch between documents, and paste.

Merge and Print

The built-in Mail Merge program allows that "personal, one-on-one" letter to be printed to a long roster of people and addresses. Merge address lists are saved as documents which makes editing and updating simple.

The back of the user's manual lists dozens of printers the program speaks to. My little Silver Reed EXP 400 didn't happen to be mentioned. A quick call to the Leading Edge 800 hot line directed me to enter "printer" in the print menu where it called for a brand name. Works great.

Up to 99 copies can be specified on the print menu. Margins and paper length settings, which pages to print (or not print), and what page to start and stop printing on, add tremendous control to the printing process.

For those who need extra help learning the Leading Edge Word Processing program, an easy to follow tutorial disk can get even the most uncomputerized mind up and operating in less than an hour.

My thoughts jolt back to the present. My boss is speaking.

"What's it going to be? Will you stop this...this Leading Edge nonsense, or will I have to take further measures?"

I want to tell him how happy I've been with my new word processing program, but he looks truly concerned. I want to share its advanced features, its ease of operation, its low, low price. But I realize the futility of it all. My corporate peers breath hard for big names and high price tags attached to software. This terrific Leading Edge Word Processing program doesn't make their hearts skip a beat. It's too simple, too uncomplicated, too...too cheap!

I choose my words carefully. "Boss, you're right. Some things are better left unsaid."

He pats me on the shoulder. "You're a good man. I knew you'd see it my way."

I hang my head and smile. ●

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Low Level Formatter continued from page 188

My Torx-15 screwdriver deflowered the screws on my Compaq. The fan-driven dust of fifteen cloistered months filtered out of the now-disrobed computer. My hands shook. As I tried to calm down, I admired the home-grown construction; the gleaming aluminum braces; the crowded collage of the motherboard. A drop of sweat fell indifferently into the works.

I carefully removed three plugs and two screws. The drive slid oleaginously out the front. I unscrewed the rails and set it aside.

The green plastic opened to reveal the Micropolis 1325 drive. Two small sacks of silica gel fell to the floor. I attached the rails, slid the 1325 in, attached the plugs. I couldn't believe I was done.

Doubt darkened my tiny fish mind. What industrial secret lay in my path? What dark worm lived between the rocks, waiting for me to swim by?

I selected number four on the menu. The drive formatted with the system. I hit the switch.

Glory Elizabeth! It signed on! Seventy-one megabytes and change! (Thanks to the software from San Diego.)

But now, two of my favorite programs didn't work: Disk Optimizer and PC Tools.

My hand strained on the telephone. Here I was with a renegade disk drive! All bets were off.

But it was only my 4K sectors. "Optimizer" and "Tools" only work with 512 byte sectors.

I partitioned the drive into two thirty megabyte drives and a ten megabyte drive. Everything works like before. Except now, I have three hard disks.

Each time the 286 boots up, I watch the screen carefully. I am expecting it to say:

"Warning: Your have violated sacred industrial secrets. Your system will now melt down."

But it never has.

I wrestled the Oriental clone onto the table. What new challenges lay before me? Would it inscrutably reject the fancy, expensive drive with a sibilant "ptooey?"

The cheap Phillips-head self-tapping screws came out of the back with a chintzy "tink" like a slug in a Coke machine.

The Western Digital controller settled into its slot. So far, so good. No rails needed. The drive sat in the cage like a frightened mink in a reptile house. Very thoughtful, these Asians. They provided a spare power connector. But ah, those two drive cables. I seemed to only have one. A good excuse to wait until Monday. I screwed the clone back together and set it aside.

Later that evening, I watched the 286 boot up. No sinister messages. I poured the files onto C: drive with the pile of Fastback disks. Tomorrow, I would divide them up among the three partitions. I crinkled the green cellophane and the silica gel and tossed them into the empty cardboard box. Hark! What's this at the bottom of the box? The missing drive cable.

The moon cast blue through the window. The house creaked its night sounds. Wearily, compulsively, I cracked the clone open. I installed the other drive cable.

The motor in the elegant Compaq drive wisked to a silky start. Except for the warning label, it seemed to feel entirely at home. But there were miles yet for the little fish to swim.

DOS 3.1 and Debug led right to the innards of the Western Digital ROM. I strung out the list of specifications and set the drive to formatting. The red light glowed warmly. I knew the format would take some time, so I switched on channel eleven and watched *She-Wolves From Venus.*

I must have fallen asleep, because I was suddenly in a courtroom. All around me were men in western suits with little silver points on their collars and bolo ties. They had "Compaq" in red embroidered on their pockets. The judge, dressed in a business-machine blue robe, looked down:

"Guilty as charged!" he proclaimed, "Take him away."

"But your honor," I protested. As I raised my right hand, there was my dreaded Torx-15 screwdriver!

Cal Worthington was selling a used Toyota, and I was a ball of sweat. An hour had gone by and the drive was still formatting! It was hot to the touch. Something was wrong.

I turned off the machine. Got to think straight. Let's see, who could I call? It's just six AM in New York. Hey! But it's business hours in Japan. Maybe I'll wait until morning. Maybe I'll call Western Digital, pretend I'm an OEM, about to purchase ten-thousand controllers to use with surplus Compaq thirty-megabyte drives.

I checked the cables. Everything **seemed** all right. We small fish do have our tricks, though. When no mate upstream, swim downstream. I reversed the big cable. Light on all the time. Wrong. No good. Machine off. I reversed the small cable. I answered the questions again. The drive formatted in five minutes. I set up the DOS partition and did the high level format.

An early squad of geese flew over the house. Sirens howled faintly outside the window, and the DOS 3.1 legend burst on the screen.

I once tried to find out from Compaq why there were no bad sectors reported on my drive. I never got an answer (of course) but now I know. The drive was probably formatted at the dealer, and when it asked for a list of bad sectors, they just never entered them. So I didn't either. However, on the seventy megabyte drive, my list added up to a little over 60K. So be it. It makes it all the safer.

The CORE speed test rates the Micropolis drive at 22 milliseconds and the 30 megabyte drive at 38 milliseconds. Nothing to sneeze at.

"The mail is here!"

Oh, my God! An envelope from Compaq.

I open it with trembling hands. How did they find out? Counterspies? Electronic eavesdropping?

Nothing like that. It's a warning label for my Compaq Portable II:

"Warning: For continued safety before servicing read bulletin 57."

Now, let's see...How do I get Bulletin 57?

I've got it! I'll call and pretend I'm the head computer technician for a large chain of tropical fish stores.

My hand strained on the phone... ●

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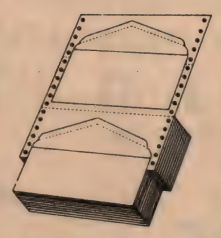

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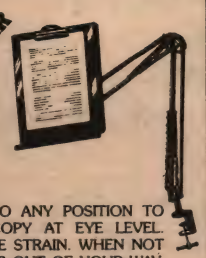

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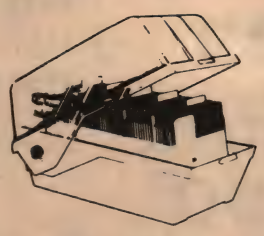

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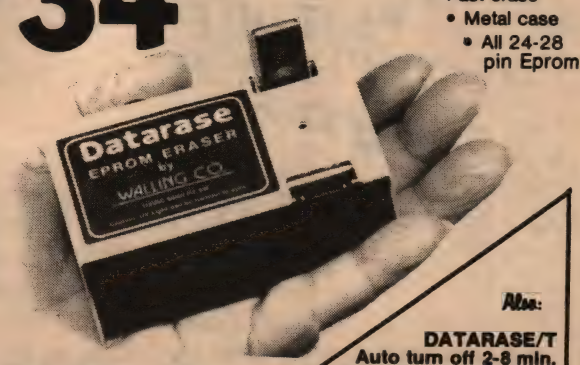

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Customizing Your Turbo Pascal System

by David O'Neal

Introduction

For those of you using Borland's Turbo Pascal to develop software, a minor annoyance is encountered every time the system is initialized, namely that the user must respond to a prompt inquiring whether or not compiler error messages are to be loaded. If the error list was longer, the option to load might be valid, but the 1.5K of memory and the few seconds it takes to read in the messages usually makes the choice here an automatic yes (Y).

The following article describes four modifications to the Turbo system. The first sets up the message loader. Others are similarly concerned with user I/O. Operations require a disk editing package. I chose the Norton Utilities.

Procedures can be implemented without knowledge of 8086 assembly langauge, but a feel for assembly-level programming will be helpful. Conceptual comments are included so that the reader might gather some insight for developing his own alterations.

A bit of advice before starting: Keep this article in back of your Turbo manual for future reference, always take "before and after" notes, and overwrite only after analyzing the "loss" of whatever is being overwritten.

Compiler Error Messages

If you are not familiar with the Norton Utilities, it might be time to introduce yourself to this excellent utility. The power of the product resides in the disk editor, NU. Any file can be examined or edited byte-by-byte, including file allocation tables (FAT) and COM files. Our aim will be to edit the file TURBO.COM.

First, the file must be identified as the object of the session. Use the Norton menus to guide you through identification of the correct directory and filename. Once the file has been formally described to the editor, we can open it and change it's contents.

Norton display modes include text, directory, and hexadecimal formats. Use the text mode to scan the program. Prompt strings appear "in English" in both the text and hexadecimal formats, but text mode pages faster and is much easier on the eyes. Prompts are readable because they are stored in ASCII format and Norton always converts byte values to the corresponding characters. They are our "road signs." Page through the file until the line "Include error messages" is seen (about 10 PgDns from the top), then switch to hexadecimal mode for editing. Use the arrow keys to move the cursor to absolute offset 11900 (relative offset varies—read on).

If you are working on a hard disk system, you may have noticed that the Norton program paused once to read the disk as we were paging through the file. If you are editing a floppy disk, the number of reads will be much higher. In any case, the offset counter is zeroed before each disk read. To convert absolute to relative offset, determine the number of bytes read in with each disk access. Call it buffer_size. Then calculate the relative offset as 11900 MOD buffer_size. For my 20Mb system, buffer_size = 8192 making the result of the MOD function 3708 bytes.

Byte offset 3708 will be a null character 00. Following the null byte will be the hex string E8 21 03 A2 48 03 74 03. The E8 21 03 part is a subroutine call to the procedure that writes the (Y/N)? prompt and then accepts an input byte from the keyboard. Input is screened for an upper or lowercase Y or N. When a valid response is detected, the corresponding uppercase character is pushed on the AX-indexed stack for use in another subroutine. This was revealed by decoding the twenty-odd bytes following (Y/N)?. If we could push a Y character on the AX stack and jump around the keyboard read, an operable bypass might be established. Without further flourish, this is exactly what will be done.

The method is to alter the hex string referenced above to read B0 59 E8 44 03 A2 48 03. The B0 59 says push hex 59 (Y) onto the AX stack. This duplicates the effect of an affirmative keyboard response. If you prefer that messages never be loaded, push hex 4E (N) in place of the Y.

The E8 opcode is, again, a subroutine call, but instead of jumping to the beginning of the procedure sitting 03 21 (801 dec) bytes ahead, we will step into the routine at 03 44 (836

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Customizing Your Turbo continued from page 191

dec), thirty-five bytes past the old location and just after the prompt and input function. Finally, the A2 instruction and its two byte argument are maintained verbatim. They are needed to copy the content of the AL register to memory.

Now, notice that the original 74 03 instruction has been "lost" in the overwrite. The argument of opcode 74 specifies the increment to the program counter, three in this case, if the AL register returns from the input function containing zero, indicating a negative response (N). Therefore, if messages are never to be loaded, ie. hex 4E (N) is being pushed, fill bytes 3717..3719 (E8 FA 0D) with hex 90 (NOP) to simulate the jump.

After editing is complete, use the <Esc> key to back out of Norton. Save the corrected bytes to disk and the procedure will be complete. When Turbo is called, you will notice only a flash where the introductory panel once stood. Input is no longer requested. Compiler error messages are strictly "load and go." I have used the altered code for about two months without side-effects of any kind. My suspicion is that the logic behind the patch is sound.

Initial Display

If you have elected to skim past the initial display in favor of always (or never) loading compiler error messages, you might want to jump past the initial display altogether. To accomplish this, find offset 3708 as described in the compiler error messages section of this paper. Now back up to offset 3422. The cursor will be sitting at the beginning of a string of hyphens (-). Edit bytes 3422..3425 to read 00 E9 1A 01. The null is an end-of-output marker and the E9 1A 01 is an unconditional jump past the display.

Changing the initial display itself is also possible, but only practical for those with ambivalent tastes in error messages. In the same general area that we discovered the (Y/N)? prompt, the text corresponding to the initial Turbo display can be found. Bytes that may be safely overwritten include offset ranges 3426..3488, 3496..3508, 3558..3563, 3581..3604, and 3612..3670. These bytes are parameters to a write procedure so that whatever is entered here appears in the initial display. Experiment within these bounds with the assurance that you can always put it back the way it was.

System Menu

The main menu can also be customized, filling a gap here or there with your logo. System prompts are best left untouced at first, but they are all part of the same display panel and are therefore future candidates for revision. Simply locate the offset range 3947..4009 (absolute offset 8192 + 3947..4009) and get creative. I eventually abbreviated the existing command prompts, alphabetized them, and put them all on one line. This freed up about twenty bytes (characters) for my own message.

The first letters of the existing system prompts are members of the set of extended ASCII characters. These characters contain color information recognized by the program menu (yellow and light gray or high and low intensity monochrome). The following scheme is specific to the Turbo environment and does **not** generalize to DOS.

Yellow text has the same least significant nibble as light gray text. However, the upper nibble of yellow text has its most significant bit marked in addition to the bits marked in the standard ASCII code for the subject character. To reiterate, standard ASCII values produce a display that is light gray. ASCII characters with the MSB marked are yellow. Note the position of any graphics character in a ROM font matrix. Shift this position to the left by eight columns (or subtract 128) to translate into the corresponding gray character.

It's probably best to incorporate the existing prompts in at least a trivial form (ala VisiCalc). As you make them shorter, additional space becomes available for fashioning your own stuff. Add your company name and the revision date to the display. Try patterning of text colors. Remember that all screen formatting (LF, CR, etc.) must be entered explicitly.

Code Marker Strings

Have you ever examined the assembly code **produced** by the Turbo compiler? It is laced with text strings identifying your COM file as a product of the Borland compiler. As it happens, the first cylinder or so of information in Turbo is a library unit copied into every COM file produced. Any resident text fields are carried over as well. If you are into commercial software development and wish to cleverly and consistently stamp a product, consider labeling an unused area of the Borland library.

Reposition yourself in the Norton Utilities disk editing function to change the TURBO.COM disk file. On the first panel (abs offset 0) you will see a Borland ASCII string covering bytes 7 to 36. This is an area of code that is included in every COM file. So is the string of 40 null bytes starting at offset 45. Use this area for your label.

Integrate your monogram or pseudonym with Borland's by overwriting the exclusive line of nulls beginning at byte offset 48. This line will now function as an indelible label for your product. Design it with care. Use the graphics set if you wish.

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Streamline The Paper Jungle With Formtool

Reviewed by Peter Ruber

There's hardly a business, organization or institution that doesn't have it's own peculiar requirements for forms that provide a trail of reference for such items as logging daily appointments, travel expenses, supply requisitions, equipment checks, receipts and what not. Quite often standard padded forms from the local stationery supplier are inadequate, so that the user has to design and print his own, usually at a significant annual cost.

Formtool from BLOC Development Corporation is an interesting and useful program for PC compatibles that allows you to create and edit forms with a minimum of effort. It doesn't offer fancy borders or designer doodads like Printshop or Newsroom. It offers, instead, a practical method of designing and printing forms that will provide immediate solutions.

Formtool can be categorized as a desktop publishing utility. However, its use isn't limited to laser printers. It will work with most dot matrix and letter quality printers. It supports standard printing as well as enhanced, high-resolution modes, depending on the printer's capabilities.

Getting Started

Formtool provides its documentation directly on the disk. Since it has undergone several upgrades within the last year that have expanded its features and support for laser printers, it is nice to know that the user manual is up to date and not stuffed with supplemental sheets that get lost with the passing of time.

After booting the disk and following the on-screen guides which bring you to the work area, press ALT-H for help. A window pops up giving you various options. The only one you need be concerned with at first is printing out the documentation. The cursor keys are used to bring the highlighted bar to this option, you hit return, and then select your printer type and port, and whether you wish to print in standard or enhanced mode.

You will not see every printer Formtool supports on the menu. The primary printers you will see listed are the Hewlett-Packard and Quadram lasers, IBM, Epson, Toshiba, Okidata, Diablo, Mannesman Tally, NEC and Okidata. Most printers on the market support one or more of these formats. If you are unsure, check your printer's manual, or use the printer configuration utility to set up the parameters for your hardware. Position the paper about one-half inch above the print head because the program doesn't issue any carriage returns for a top margin. It starts printing at the top of the page. The user guide is 55-pages.

Formtool is a memory resident program. You can use it with Sidekick installed in memory as long as Formtool is the last program to be loaded. Among the initial setting up that you can do is to create a configuration file that writes the name of your printer, the type of printing mode you wish to use, and your port assignment so that it becomes part of the root directory when you boot the disk. This saves going through the hassle of entering this information every time you wish to print out a document.

You may also wish to include the type of video display card you are using and the default drive on which you intend to store your form files. You will need at least 256K of memory and two floppy drives. Although, as I mentioned, Formtool is memory resident, some of the command files and help menus are not, and you will have a fair amount of disk intensive activity which can make the program and the drawing mode seem a little sluggish at times. A hard disk is the preferred method because of its inherent speed advantage.

When you begin your work, you can choose any standard page size—8.5x11, legal, 11x8.5 or custom sizes that are specified by cell dimensions. Widths up to 132 cells wide are supported, although your visual workspace is only 72 cells wide. Moving the cursor to the right will cause the display to shift to the left. By the same token, if you wish to move up and down quickly, you can use the PgUp and PgDn keys. In fact, Formtool,

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The Paper Jungle continued from page 194

makes liberal use of all function keys and combination key sequences using the SHIFT, ALT and CTRL modifiers.

While ALT-H brings you into the HELP mode through which you can access an abbreviated version of the printed documentation, you will more likely work with the master menu window using ALT-M. Here you will find 55 editing, drawing, and assorted functions that you can access either by bringing the highlighted block to the appropriate item and hitting <RETURN>, or by typing the function key sequence.

Your main work area looks like a typical spreadsheet. Columns and rows (cells) are numbered across the top and down the left side. There are two basic modes: drawing and typing. The drawing mode allows you to lay out your form and the typing mode enters text. The text will only print in normal or bold if so marked. The exception to this pertains to laser printers only, because the program permits you to define any resident font file, which will enhance the aesthetic appearance.

However, if you have created any special lettering or graphics with another program that are necessary to the form, you can transport them through the ASCII interface that Formtool provides. This is accomplished through a DOS interface that lets you remove the program disk and load a new disk in Drive A, so that you can bring the desired graphic to memory. All this while, Formtool and the form you are creating remain safely in memory. When you have imported your graphic it will overlay your form and you can plan it around the screen to determine the best position and even edit any borders that might surround it. The same applies to any grid design that had been created for a previous form. This, too, can be imported, and any inappropriate areas can be blocked off before it is incorporated into the current work area.

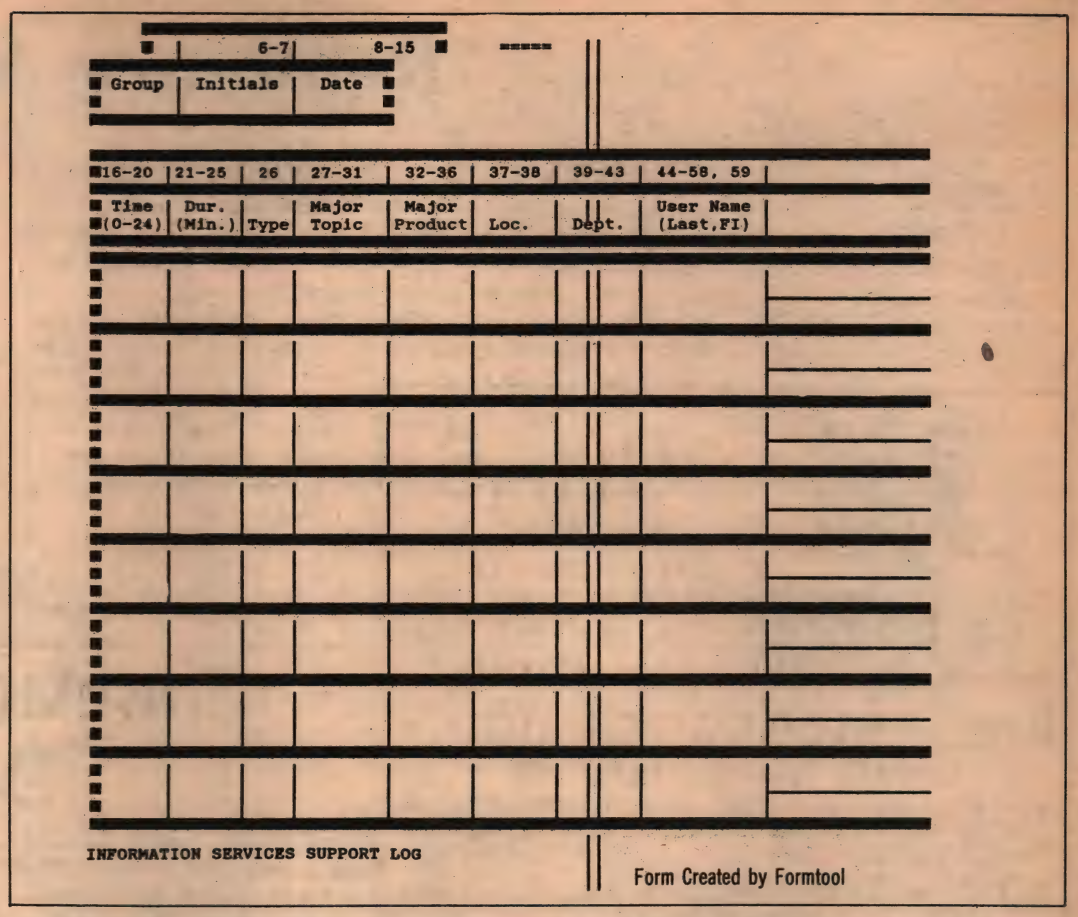
Among the other niceties are the ability to justify text either left, right or center, a database that allows you to view through a window all form files on your data disk. You can sort these alphabetically, by category or by date. There are even advanced programming features for Macros and Flags that will permit you to access special printing modes, carriage returns, line feeds and printer control codes directly from the resident program.

Considering the length of the manual, it adequately covers hundreds of features and options in a clear and readable style. Like other programs that seem simple in concept when you first approach them, Formtool packs a sophisticated whallop because of its user-friendly way of doing its job. You needn't use the cursor keys to draw horizontal or vertical lines. You simply position the cursor to the desired spot and use the function key sequence to draw them. This enables you to prepare even a complex form in just a matter of minutes. If you find that you didn't leave appropriate space for your text headings, you can delete and redraw these lines instantly. Special boxed areas, though, must be drawn via the cursor keys. And, if they're poorly placed, they can be blocked off and moved. All of which makes it kind of fun to use.

To simplify your initial use of this program, once you've entered the master menu with ALT-M, hit the SHIFT—PrtSC keys and print it out. Then you can experiment with it by using the function key sequences to create your form. There are no stumbling blocks to stifle your imagination, providing that you remember this is a functional working tool and not a graphics device. When you're ready to print out your form you can select to print single or multiple copies up to 255.

A final touch worth mentioning is that Formtool has a number of built-in safeguards that question you about saving your work before exiting; and if you happen to hit a couple of wrong keys, the program will not lock up like some others I've used.

Formtool is not copy protected and sells for $95. It is distributed through normal dealer channels. For additional information, please contact: BLOCK Development Corporation, 1301 Dade Boulevard, Miami Beach, Florida 33139, 1-305-531-5486. ●



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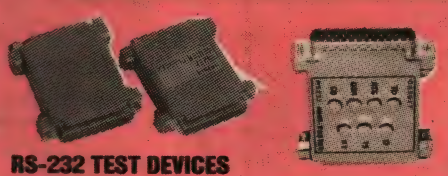

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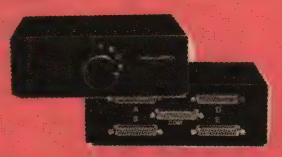

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Reference Set

Reviewed by
Ronny Richardson

Introduction

The thesaurus is the latest and hottest electronic writing aid. A thesaurus suggests alternative (alternate, equivalent, substitute) words when a word "just does not look right." Thesauri have their roots in the work of a 19th century surgeon by the name of Peter Roget. His hobby was classifying words by their meaning. The thesaurus was the natural outgrowth of this hobby. Long available (accessible, close, convenient, feasible, functional, handy, helpful, multipurpose, nearby, open, practical, public, reachable, ready, serviceable, suitable, unrestricted, usable, useful, utilitarian, well-suited, within reach, working, close by, convenient, near, nearby) in printed form, the thesaurus is just becoming available in electronic form.

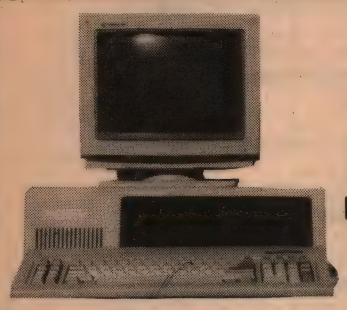
Installation

Since Reference Set is not copy protected, installing it is easy. You create a sub-directory. Then you copy all the files to that sub-directory. You then run an installation program to tell Reference Set what word processor you use. Finally, you add the appropriate start-up commands to your AUTOEXEC.BAT file. Like all memory resident software, this is straightforward only when it is the only memory resident package being used. When used with other memory resident software, finding the proper loading order can be an ordeal in combinatorics (the mathematical branch dealing with all possible combinations). Contrary to what the manual states, when used with Borland's SuperKey and Sidekick, Reference Set must be loaded after SuperKey but before Sidekick.

Using The Thesaurus

When you install Reference Set, you can change the "hot keys." If you did not do that,

continued on page 197



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Compaq Lowers Compaq DeskPro Price

Compaq Computer Corporation has announced a change in the suggested resale price for the Compaq DeskPro Model 2 from $2,399 to $1,699 (U.S.) and a reduction in the number of models within the Compaq DeskPro product line.

"The 8086-based Compaq DeskPro offers users two-to-three times the processing speed of the IBM PC/XT and other 8088-based products, the ability to incorporate four internal storage devices versus three for the XT and the capability to add an internal fixed disk drive tape backup," said Mike Swavely, vice president of marketing, Compaq Computer Corporation. "Because we are combining these features with the Compaq reputation for quality and this new price, the Compaq DeskPro represents outstanding price/performance in an entry level desktop personal computer.

"Volume PC buyers will find the Compaq DeskPro a particularly attractive purchase, especially as a complement to the Compaq DeskPro 386 when used in networking and multi-user applications," said Swavely.

Compaq said that the price change was made possible due to the strong market success of the Compaq DeskPro and the company's continuing ability to reduce production costs.

The company also said that the Compaq DeskPro Models 1 and 3 would no longer be sold. By offering the Compaq DeskPro in a single model, Compaq said it was able to help dealers reduce their number of Stock-Keeping Units (SKUs) and thereby lower their overhead.

The Compaq DeskPro Model 2 is immediately available from authorized Compaq computer dealers throughout the United States and Canada and is equipped with 256 Kilobytes of random access memory (RAM) and two 360 Kilobyte diskette drives.

For more information contact Compaq Computer Corporation, 20555 FM149, Houston, Texas 77070; (713) 370-0670.

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Reference Set continued from page 196

you invoke Reference Set by moving the cursor to a word and then press Alternate T. A half screen size window will appear on either the top or bottom but where it does not cover up your word. This window will contain the suggested replacements. At this point you have four options. 1. You can manual key in another word to look up. 2. You can press return to exit Reference Set. 3. You can move the cursor to a new word and press the Insert key to place it in the document in place of the original word. 4. You can use the page up to view more suggestions, if any.

Using The Spelling Checker

To check the spelling of a single word, you move the cursor to that word and press Alternate D. A window similar to the thesaurus window pops up with possible spellings. If the word is spelled correctly, the word will be highlighted. You have three choices. You can press return to exit. You can manually enter another word to look up. Or you can move the cursor to a word in the list and press Insert to have that spelling replace the spelling in your document. Once you are at this screen, it is relatively easy to find the spelling for words you cannot make a good guess at the spelling. Reference Set will allow you to enter vac* to find the spelling of vacuum.

If you run a second optional program (REFSCRN), you can use Reference Set to check your spelling one screen at the time. This is useful for checking changes to a small area of a large document. Pressing Alternate S will check the spelling of the entire screen and unknown words will be highlighted. This feature does not allow correction, just highlighting and when you move the cursor, all the highlighting disappears. You can redisplay the highlighting with Alternate R.

Reference Set will also function as a simple document spelling checker. By entering REFSPELL FILENAME from the DOS prompt, the spelling of the entire document is checked. Once the document has been checked, you have three options for each incorrect word. You can mark incorrect words. You can add correct words to a user dictionary. Or you can correct the spelling. When correcting words, the program shows several lines of the document in context.

Reference Set also comes with a program to add words from the auxiliary dictionary to the master dictionary. Words are added to this dictionary during spelling checking when you tell the program to learn a word. You can also add words with any ASCII word processor. Running DICTADD moves words from the auxiliary dictionary to the main dictionary to speed operations.

Utilities

Pressing Alternate U brings up the utility menu. Pressing F1 lets you look up a word in the dictionary. Pressing F3 lets you look up a word in the thesaurus.

Reference Set allows you to store nine different phrases in a glossary. Each phrase can be up to 70 characters long. Pressing F3 followed by a number from one to nine lets you enter or edit that glossary entry. These phrases can be phrases common to your writing (I used #1 as "Reference Set" for this article) or they can even be DOS commands. Pressing Alternate G# types out the # glossary entry.

Pressing F4 lets you display a file. You can move forward one screen at a time but you cannot move backwards. You can quit at any time by pressing Q. Pressing F5 performs a directory [DIR]. You are first prompted for the directory and disk.

Specifications

Reference Set has a large (83,000 words) dictionary for hard disk systems and a small (50,000 words) dictionary for floppy disk systems for spell checking. You can add words

continued on page 200

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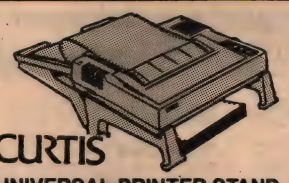

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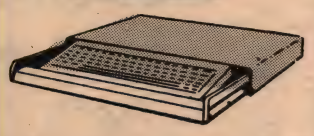

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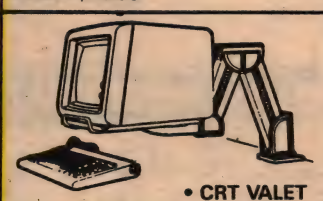

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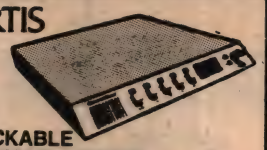

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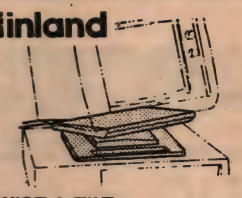

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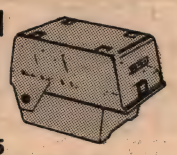

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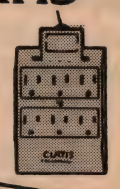

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by Ron Richardson

Introduction

There are three ways to protect the data on your microcomputer. You can remove the data from the computer and lock it up, using either floppy disks or a Bernoulli Box. If you use floppy disks, you must make sure that none of the information can be recovered from the machines hard disk using a file unerasing program such as the Norton Utilities. A second way to protect your data is to encrypt it, using an encryption program such as the one that comes with SuperKey. Using this method you must make sure that the password remains secure but not forgotten. You must also make sure that all copies of the data, including any .BAK files, are encrypted. The third way to secure your data is to prevent unauthorized users from using your computer. ATs and clones use a lock and key to prevent unauthorized usage. The X-Lock 100 card from A-O Electronics, Incorporated is a much more sophisticated way to control access to any IBM PC, XT AT, or clone.

Function

The X-Lock 100 is a short card that forces anyone trying to use the computer to enter a password. Anytime the computer is turned on or rebooted, the user is presented with a log on screen. The user then gets ten attempts to enter a correct password. After ten tries, the computer "locks up." A-O Electronics indicates that there are 5,072,820,000,000,000,-000,000 trillion possible passwords, so random guessing is not likely to be successful. Since X-Lock is a card and not a program, it is not possible to defeat it by booting off the A drive. My teenage son, who loves trying to break these types of codes, has no success.

The X-Lock card does more than prevent access by unauthorized users. Each of 72 passwords has associated attributes. Each password can be allowed or denied access to any parallel port and to any hard disks. The time each password uses the computer is recorded and made available in a database. So different passwords can be assigned to different projects and X-Lock will track

continued on page 201

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Reference Set
continued from page 197

to either dictionary. The thesaurus has 5,000 root words with 50,000 synonyms. These word lists are not loaded into memory, so they must be available on disk. The main program requires 26K of RAM. An optional screen spelling checker requires an additional 17K.

Support

Technical support is only a toll call away. Unlike some companies, there is no charge for technical support. Registered users receive upgrades for a small fee. To upgrade to 2.0, you mail back your original disk with a five dollar service charge.

The manual is well written and easy for a beginner to follow. It fully explains all the features and limitations of Reference Set. Its only shortcoming is in the very knotty area of installing Reference Set when you already have several memory resident programs. The manual has both a table of contents and an index.

Problems

Reference Set will not work with programs like Enable or Symphony that write to the screen in graphic mode. When used with Microsoft Word, you must start Word with the /C (character mode) switch which reduces Word's ability to perform on screen formatting. Word uses undocumented [in DOS] keystroke combinations like Alternate Space and Control Space for formatting. Reference Set blocks these so that Word sees them as just a "regular" space. With Word version 3.1, you cannot use the cursor control keys to select words within a thesaurus or dictionary window.

Conclusion

I used Reference Set for over a year with Wordstar without any difficulty. For this review, I tried it with several other word processors and the only one it had difficulty with was Microsoft Word. Now that Word 3.1 has a built-in thesaurus, you do not need Reference Set with Word. If you are using Wordstar, Newword, PC-Write or another word processor that does not have a thesaurus and does not work in graphics mode, then Reference Set is a valuable tool.

Reference Set, Reference Software, 330 Townsend Street #135, San Francisco, CA 94107; (800) 826-2222. $69.00 without spelling checker, $89.00 with spelling checker. ●

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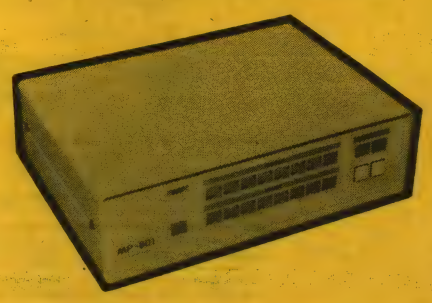

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X-Lock
continued from page 200

time for billing. X-Lock tracks all printer usage.

Installation

The steps to installing the X-Lock card are:

1. Remove the computer cover.
2. Remove the rear cover plate to the slot to be used for the X-Lock.
3. Remove a yellow tab on the X-Lock card (used to protect the battery) and insert the X-Lock card in the appropriate slot. At this point the manual indicates that you should reinstall the cover, however, that is not necessary if you are careful.
4. Turn on the computer. The X-Lock card will perform a diagnostic test.
5. Turn the computer off, remove the X-Lock card and change the setting on dip switch 8.
6. Reinstall the card.
7. Reinstall the cover.
8. Turn on the computer. The first time the computer is turned on, the X-Lock will ask you to enter a "superuser" password. A superuser password allows you to access all devices as well as assigning and changing passwords.

The entire installation took me less than ten minutes.

The X-Lock card also comes with a lock to prevent unauthorized removal of the computer cover. This lock is a metal tube with a small hole in one end and a large hole in the other end. You insert one of the cover screws into the large hole to where it protrudes through the small hole. You then screw this into one of the cover screw holes. The large hole is then filled with a lock. Once installed, if you grab the metal tube and pull while unscrewing, you can remove the whole assemble without even using a screwdriver.

Using The X-Lock

Once you have entered your password, the X-Lock is completely transparent unless you try to access a device not authorized by your password. The card comes with software that allows each user to check his time on the system and allows superusers to check everyone's time. The software is not copy protected.

Problems

The card has several problems. When you enter the initial password, it is not displayed on the screen, you are not asked to verify it, and there is no way to correct a typing mistake. It is common for password software to ask for the password twice and require a match before continuing but X-Lock does not. In addition, the backspace key does not remove typing errors but is instead read as one of the characters of the password. In addition, X-Lock leaves the A drive spinning while asking for a password. If ten incorrect tries are made to enter a password, X-Lock locks the computer, but leaves the A drive spinning. This means that an undetected unauthorized entry attempt could cause your A drive to spin forever.

In addition to these two major problems, X-Lock has several minor problems or deficiencies. You must either give a user no access to the hard disk or unrestricted access, you cannot give limited access to only a few sub-directories. There is no way to lock out destructive commands like ERASE*.* or FORMAT C:. The only way to switch users is to turn the computer off or reboot it.

Conclusion

The X-Lock offers a simple effective way to restrict computer access and to track computer usage. Any computer with sensitive information stored in it that is accessible by unauthorized personnel would benefit for the card especially if combined with a more effective cover lock than the one provided with the card.

For more information, contact A-O Electronics, 2137 Flintstone Drive, Tucker, Georgia 30084; (404) 491-8044; X-Lock 100 $495. ●

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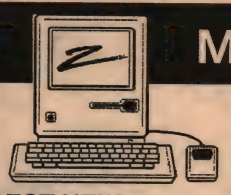

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PC WEEK, 11/85

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PC WORLD, 8/86

"Of all the compilers reviewed here, ZBasic was the most fun to use. It has a real "personality" and a solid feel..."
PC TECH JOURNAL, 12/86

Compare:	Sieve	Sort
ZBasic 4.0	13.7	14
QuickBASIC™	14.0	25
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NEW 4.0 features:
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"fast, generates stand-alone programs, requires only modest amounts of memory, has outstanding compilation speeds... and the price is very attractive."
Computer Language, 12/85

Compare:	Sieve	Sort
ZBasic	24	30
MSBASIC inter.	2160	4945

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The Sharp PC 7000 is different. It is a portable that makes sense. The keyboard is roomy and full size — you don't have to have dainty little hands or hold them in an unnatural position to get your work done. The keyboard even has 10 separate function keys and a separate numeric keypad.

The lightweight built-in flat screen of the Sharp PC 7000 is different too. It has a standard 80 column by 25 line screen that is super readable from any angle. It has a bright, clear, high-contrast image that you can control with the touch of a knob. So, you don't need special lightning or x-ray vision to read it. In fact, PC Magazine editors found it "...absolutely the best LCD-based display yet seen...perhaps the first LCD that would be comfortable to work on all day."

The Sharp PC 7000 is an elegant computer filled with super features including a built in calendar, time clock, parallel port, serial port, switchable 4.77 MHz and 7.37 MHz operation, built in monographic capabilities, and two full size 5 1/4 inch disk drives.

Close Up and Carry Anywhere

The Sharp PC 7000 is super portable. It easily fits under an airline seat so it can be carried on board. And, although it weighs nearly 19 pounds, it is so carryable — it seems much lighter. There's no unnecessary bulk or wasted space in this computer.

It comes with 320k RAM but can easily be expanded on the motherboard to a whopping 704k. And, if you do a lot of number crunching, you can put an 8087 math chip on the motherboard too. In addition, you can also get your PC 7000 an optional 1200 baud auto-dial, auto-answer internal modem, or, if you like, buy the CRT color adapter card. This card fits inside the PC 7000. It lets you use any standard external monochrome or RGB color monitor with the computer. The Sharp color adapter card conforms to the more expensive IBM PC color graphics adapter.

The Sharp PC 7000 packs the speed, power, and convenience of a desktop computer into a lightweight portable. So, if you need a spacious interior for plug in cards, there isn't much here. However, Sharp also makes an optional expansion unit. It is exactly as wide and long as the PC 7000, and holds three full or half size add-on boards or a 20 megabyte hard disk if needed. The only thing is that not all PC hardware will work in the expansion unit, and these options are only available from Sharp.

Clean Bill of Health

Despite these shortcomings, the Sharp PC 7000 is a great computer. It is a first rate compatible, and runs all popular IBM software. It has gotten a clean bill of health from major corporations. It's on the buy list of government organizations too. The Sharp PC 7000 is the only portable approved for purchase by the state of Arizona. Many accounting firms also recommend it as a completely standard portable system.

Why this Low, Low Price?

Wow! Now you can save big because Sharp is introducing a new portable called the *PC 7000A* in about 60 days. The difference between the PC 7000A and the PC 7000 is — the 7000A comes with a twisted screen display. This makes it a bit more readable, but the price of the PC 7000A is going way up too.

You can see from the quotes here that the Sharp 7000 has gotten rave reviews. It's a great computer with a super readable tilt screen. It runs all popular IBM type software like Lotus 123, dBase III, Flight Simulator, and on and on. However, a new model is coming so if you hurry, you can get one of the last few remaining Sharp PC 7000s from Central Computer at only $749.

To avoid disappointment, please order today. Remember quantities are limited. This is not a fire sale. The Sharp 7000 is not an orphan computer. The PC 7000A looks just like the PC 7000. Both share the same options including a portable printer, internal modem, and internal CRT color adapter. So these products will continue to be available for your PC 7000. These are brand new computers. $749 price includes all the manufacturer's warranties and a handsome $79 travel case with generous side pockets free. Order today.

Sharp PC 7000 Specifications

● 8086 CPU switchable to 4.77 MHz or 7.37 MHz ● 8087 socket for math chip ● 320k RAM expandable to 704k on the motherboard ● 2 5¼ DSDD 360k floppy drives specially shock mounted ● Documentation includes Sharp PC User's Guide and MSDOS Reference Manual ● 1 parallel printer port ● 1 serial port ● MSDOS 2.11 operating system ● Built in diagnostics ● Full size 84 key AT-type keyboard ● 120 volt power ● Weighs 18.8 pounds ● Built in carrying handle ● Backlit LCD flat screen ● Entire unit 16 5/32 inch wide x 6 5/16 inches deep x 8 15/32 inches high ● Plus see optional features below

Critics' Corner

"The Sharp PC 7000 is an 18 pound package full of great surprises. An electroluminescent panel illuminates (backlights) the 25-line by 80-character crystal display — the result is easy readability in all lighting conditions."

"About the size of a double toaster..."

— *Pico Magazine*

"The Sharp PC 7000 is a well-built, quality portable...it has many...endearing touches."

"...this is the most readable LCD screen we have seen. It is backlit, and the contrast is adjustable for a wide range of lighting conditions."

"...comes with color emulation in shades of gray, so you can run color software on the LCD screen."

"...the Sharp PC 7000 is noticeably faster that the IBM PC running at standard speed."

— *Infoworld Magazine*

"Even more impressive was Sharp's $1795 PC 7000....Its LCD screen with electroluminescent backlighting is absolutely the best LCD-based display yet seen. It is fast, smear-free, and easy to read — perhaps the first LCD screen that would be comfortable to work on all day."

— *PC Magazine*

"...the PC 7000 is a strong alternative to either buying an additional computer for working at home, or carrying bulkier transportables home with you or on business trips."

— *Personal Computing*

It's true, the Sharp PC 7000 isn't a half-pint lap top. Instead it's a full size computer in a very small footprint. If you need a portable and real computing power — the Sharp PC 7000 is the choice of tens of thousands of professionals. The retail price of the PC 7000 is $1795. But, Central's new low, low price is only $749. Includes free gift too. Order today.

Attention: An optional companion printer is available for the PC 7000. It snaps right on the back of the unit for complete system portability. The CE700P is a 72 cps dot matrix with near letter quality capabilities that prints on plain paper. It has a variety of font styles including Pica, Elite, and Condensed, and is an elegant companion to the PC 7000. Order today.

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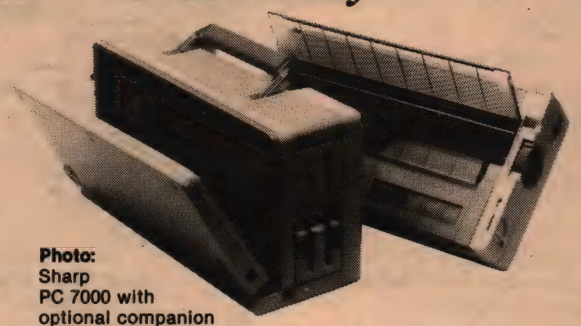

Photo: Sharp PC 7000 with optional companion printer. Snaps onto back of unit for complete system portability.

Selected Sharp PC 7000 Features

● Pop up feet on keyboard hold it at two angles ● Set up program lets you change system parameters at the touch of a key even while working in a program ● Adjust internal clock, calendar, cursor blink, type of cursor (block, underline, underbar), how long cursor blinks, standard or inverse display mode, printer type, baud rate, processor speed, how long screen stays on before blackouts, and much more at push of a key ● Flat panel display tilts at three angles at the push of a button for comfortable viewing ● Adjust intensity of backlit screen image with another knob ● Disk drive indicators next to screen on front of system light up to show which disk drive is in use ● Keyboard cable housing along front of unit ● Modular printer clips onto back of computer for easy portability ● Large, 25 line, 640 x 200 pixels, bit-mapped illuminated crystal display for clear, detailed graphic images and text display

Sharp PC 7000 Options

Order No.	Description	List	Central
04 S320	Sharp PC 7000 320k	$1795	$ 749
04 S704	Sharp PC 7000 704k [1]	$1895	$ 819
04 SPRI	Sharp CE700P Printer [2]	$ 449	$ 359
04 SMOD	Sharp Internal Modem [3]	$ 369	$ 289
04 SCOL	Color CRT Adapter [4]	$ 265	$ 219
04 SHAR	Hard Disk CE720E [5]	$1395	$1199
04 SEXP	Add-on Expansion Unit [6]	$ 400	$ 359
04 SRAM	128k RAM Chip Set [7]	$ 79	$ 49
04 SGWB	Sharp Carrying Case [8]	$ 79	$ 75
04 SRIB	Sharp Printer Ribbons [9]	$ 26	$ 24
04 SMON	Sharp RGB Monitor [10]	$ 595	$ 469

1. Central Computer populates board and tests unit.
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9. Set of four ribbons for Sharp CE700P printer.
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Software in Review

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Free Filer Search though any disk. Find information fast. Helps you find strings of alpha or numeric characters whether they're in a formalized database or just loosely thrown together on a disk. Rips through disk to find what you want fast. Jerry Pournelle calls it, "one of those wonderful little general-purpose text utilities that simplify life with computers." Can also be used as a free form text filer. No structured fields needed. Target right files fast with boolean AND, OR, NOT type logic. Works on hard disks too. $49.

Uniform Read and write more than 175 computer formats. Transfer data from one format to another. Easy to use. $59.

Home Inventory Plus Keep organized records of personal property like jewelry, coin collections, insurance papers, credit cards, furniture, tools, clothing, machinery, and so on. Set up and ready to use. No programming. Get printed reports about the dollar value of items kept in any room, area, or entire home or office. Perfect for determining value of individual or group of items like jewelry or coin collections, for example. In the event of a loss, you can use these printed reports as evidence of ownership to help assure a quick and fair settlement. $39.

Lotto Master Comes with a unique database that lets you track and analyze winning numbers. You may be able to use this information for projecting the future. Play and track more than one lottery too. It can also be altered so you can play any lottery up to 9/99. Test out numerous schemes at once. Exciting. $25.

All programs come complete with documentation. Order today.

12 inch monochrome monitor on tilt and swivel base.

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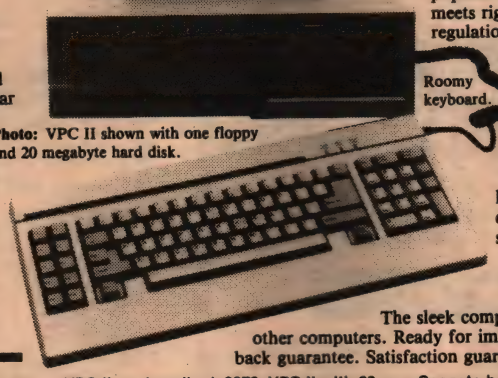

Photo: VPC II shown with one floppy and 20 megabyte hard disk.

PC Magazine's Editor's Choice

The Victor VPC II is a great value even at $1495 retail. No wonder. Victor Technologies has a reputation for manufacturing excellence that spans 68 years. You can see it sparkling in the quality clean cut, high-tech look of their Victor VPC II. Name brand performance.

PC MAGAZINE EDITOR'S CHOICE

In the lead story of the October 1986 issue of *PC Magazine*, the editors picked the Victor VPC II as the best built PC compatible. They found many of the other computers were not well made. Cheap.

The Victor VPC II uses a non-copyright infringing BIOS that guarantees 100% IBM PC compatibility. It works all popular IBM-type software and hardware. It also meets rigid Federal Communication Commission regulations and UL electrical safety standards. That means it can be operated anywhere.

These and other features help the Victor VPC II win the compatibles race hands down. It comes complete with a full 640k RAM on the motherboard, a beautiful AT-style keyboard with a large return key and separate numeric keypad and function keys, two 360k floppy disk drives, monochrome monitor on a tilt and swivel stand, and built-in serial and parallel printer ports. You get everything you need in this mouthwatering, trouble-free high performance name brand computer.

The sleek compact design uses 25% less desk space than other computers. Ready for immediate shipment. Includes 30 day money back guarantee. Satisfaction guaranteed. Order with confidence. Order today.

VPC II as described: $979. VPC II with 20 meg Seagate hard disk: $1319. Please add $35 freight per unit.

$979

Includes free — $25.95 cloth cover and $49 no-slot clock.

Victor VPC IIE Specifications

- 8086 CPU switchable 4.77 and 7.76 MHz
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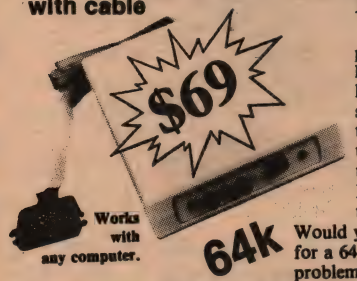
- Two 5¼ DSDD 360k floppy drives [1]
- 1 parallel port
- 1 serial RS232 serial port
- MSDOS 3.1 operating system software
- VBasica (GWBasic) software
- Diagnostics software
- 12 inch monitor on tilt and swivel base
- Hercules compatible monographics card
  Resolution: 720 x 350 dots
- 89 key AT-style keyboard
- Reset button on front of unit
- Three Part Documentation Package
  VPC II User's Guide
  MSDOS Reference Manual
  VBasica Manual
- One year parts and service warranty [2]

[1] Optional one floppy and hard disk
[2] Provided by Xerox and Victor

Printer Buffer

with cable



Wow! This price busting printer buffer is selling like hotcakes. But, frankly, I'm a little puzzled. This beige box is so handy and saves so much time, why aren't we selling thousands more? Is it because the price seems far too low? Do you think it must be junk to sell at this low price? Would you rather pay $200 or more for a 64k printer buffer? What's the problem? Come on, please order today

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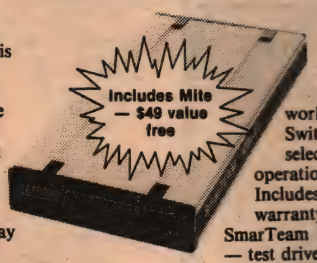
Self-test ● Reset button ● Auto-diagnostics ● Multi-copy functions.

1200 AT Modem



The SmarTeam 1200 AT is a 100% Hayes compatible auto-answer, auto-dial modem that works on both tone and pulse phones. Switch selectable with auto-speed selection. 0-300 and 1200 baud operations. 102 and 212A Bell compatible. Includes two year factory parts and service warranty. In addition, if you purchase the SmarTeam 1200 AT from Central Computer — test drive it for 60 days risk-free. Hayes compatible and trouble free or money back.

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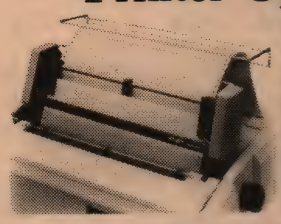
Pepsi can is taller than this printer.

Attention: Serial Hush 80S $159. Rechargeable serial $179. Includes cable.

● Super quiet ● Reliable ● Portable ● Regular and battery operated

Printer Upgrades



The bidirectional tractor shown here is for Kaypro printer and Juki 6100 users. Includes an exclusive anti-blacklash drive for precise positioning of continuous paper and clear printing. Trouble free performance. Year warranty. 30 day free trial. $125. Order today.

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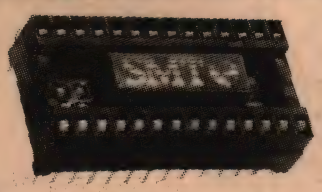

The SMT No-Slot Clock is a real-time clock and calendar that can be used in almost any computer. You don't waste a slot in your computer either. Just push it into any 28-pin ROM socket on the motherboard. If you don't have an empty socket, simply take out a PROM from a socket, install the No-Slot Clock — then replace the PROM that was in the socket onto the back of the No-Slot Clock. No soldering. Easy to do. Does not disturb your computer. The No-Slot Clock comes with 2 lithium batteries and keeps time for more than 10 years. Can be used in PCDOS, MSDOS, Apple ProDOS, and Apple DOS 3.3 computers. Includes three year warranty. Very easy to install. Comes with small manual and startup software. When ordering, please specify computer type. . $49. Order today.

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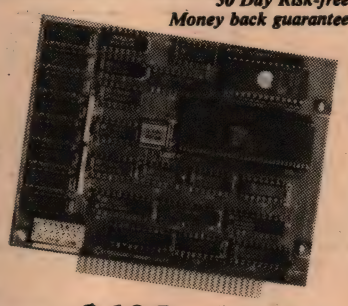

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Turbo Pascal Quiz Programs

by Norman L. Riger

The best programming language is the subject of many heated arguments and the people that argue the most about this subject usually write fewer, if any, programs. Instead of wasting time with senseless arguments, it is better to sit down at the keyboard and begin writing code. The fact that you can't think of any good ideas is no excuse as you can always translate old programs from a different language. Translating old programs helps you increase your skill and provides fresh evidence for you to use in future arguments.

Many good things have been written about Pascal, especially Borland's Turbo Pascal. Turbo Pascal programs compile quickly and run fast. The editor is easy to use and the language is as easy to use as BASIC. The programs in this article are similar to the BASIC versions published in the February, 1987 *Computer Shopper* but are written in the MSDOS version of Turbo Pascal for a Tandy 1000 with 640K of memory, a color monitor and two disk drives (one 40 track and one 80 track). Without any changes, these programs should run on the IBM PC (or any clone) and any CP/M system with Turbo Pascal.

Pascal programs are usually longer than BASIC programs because they are structured and all variables must be defined at the start of the program. Most lines end with a semicolon. The words "begin" and "end" and each procedure make the code easier to follow.

Number Attack (Figure 1) is a keypad dexterity training program. A three digit random number is displayed in the center of the screen for the student to attack. The score is updated at the upper left. Use the Num Lock key to shift the keypad and don't watch your fingers as you peck in each digit.

Each Pascal program begins with a name and Number Attack has two types of variables, "char" and "integer." The Setup procedure clears the screen, uses direct cursor addressing to display the score, generates a three digit random number and uses direct cursor addressing again to display the bait in the center of the screen. Notice that the "errors" and "score" variables are set to zero before the Setup procedure is encountered in the main body of the program. The three digits entered by the student (f, s & t) are "char" variables and must be changed to "integer" variables before they can be assembled into a three digit number, which is compared to the bait. The while loop is set to end the program after fifty numbers are processed or five mistakes are made. A mistake occurs if one digit of the three digit number is keyed in incorrectly but if all three are keyed in incorrectly, there is still only one mistake.

Programming isn't learned by simply typing in programs and making them run. Each reader is encouraged to make

continued on page 205

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```
program NumberAttack;
var  f, s, t: char;
     score, errors, first, second, third, bait,
     answer: integer;
procedure Setup;
  begin
     TextMode(BW80);
     gotoXY(1,1);  write('Score:  ',score);
     gotoXY(1,3);  write('Errors: ',errors);
     bait := trunc((random*1000)+(random*100)+(random*10));
     if bait > 999 then bait := bait - 1000;
     if bait < 100 then bait := bait + 100;
     gotoXY(38,12); write(bait)
  end;
begin
  errors := 0; score := 0;
  while (score < 50) and (errors <5) do
    begin  Setup;
           read(kbd, f, s, t);
           first := ord(f) - 48; second := ord(s) - 48;
           third := ord(t) - 48;
           answer := first * 100 + second * 10 + third;
           if answer = bait then score := score + 1
           else errors := errors + 1;
    end;
  write(' Score: ',score, ' Errors: ',errors)
end.
```

```
B>
program wordwar;
var filename: text;
    nameoffile: string[14];
    answer, bait, response: string[25];
    score, errors: integer;
begin clrscr;
      write(con,'File name? ');
      readln(con, nameoffile);
      assign(filename, nameoffile);
      {$I-} reset(filename) {$I+};
      errors := 0; score := 0;
      repeat
           clrscr;
           gotoXY(1,1); write('Score:  ',score);
           gotoXY(1,2); write('Errors: ',errors);
           readln(filename, bait);
           readln(filename, answer);
           gotoXY(35,12); write(con, bait);
           gotoXY(35,13); readln(con, response);
           if response = answer then score := score + 1
                else errors := errors + 1;
      until (eof(filename));
end.
```

Son of Market Trend Analyzer

by Robert C. Moyers

With falling interest rates and a strong bull market, a program such as the Market Trend Analyzer, published in the January 1987 issue of *Computer Shopper*, comes in handy. The program helps in the management of switches between money market funds and stock based funds, and provides a tax deduction in the form of depreciation on the personal computer. This tax deduction is meaningful to personal computer owners who are not using the personal computer for qualified business use.

The original Market Trend Analyzer was rewritten, and several improvements were made. Here comes Son of Market Trend Analyzer written in structured BASIC, suitable for QuickBASIC (Microsoft). If the QuickBASIC compiler is used, then program may be executed with the DOS command TREND.

Distributions from the stock based fund are now reinvested into the fund, increasing the number of stock fund shares held. The fact that a distribution has been made no longer signals a buy. This was incorrect, since distributions result in neither an economic gain nor an economic loss.

Son of Market Trend Analyzer obtains dates, closing prices, distribution amounts, and money market interest rates from a PRN file. Such files are created by Lotus 1,2,3 from a "Print File" command. The user is not restricted to Lotus 1,2,3 PRN files. Any spreadsheet, database or ASCII file editor is capable of producing this type of file. Son of Market Trend Analyzer is easi-

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Turbo Pascal Quiz
continued from page 204

as many changes as possible. Consider examining each separate digit from the keypad for accuracy. This makes it possible to make three errors for each "bait." Try using variable length and decimal numbers. Modify the program to use upper and lowercase letters and symbols instead of numbers. Try saving each error in an array with the idea of determining whether more errors are made with one particular number more often than with others.

Word War (Figure 2) is a foreign language vocabulary training program and requires an input file. As an example, if you want to practice Spanish, the input file consists of pairs of English and Spanish words. Each word is on a separate line and followed by a carriage return. The first word of the first pair is displayed in the center of the screen and the student types the translation, which is compared to the second word of the pair. The score is shown at the upper left. It doesn't matter if the first word of each pair is Spanish or English so one version of the program can be used to show Spanish words and process English answers or show English words and grade Spanish answers. If you prefer, the order of the words can be changed as often as desired. If the student sees a Spanish word, the answer will be in English and the other way around. The fun is increased by using words that are the same in both languages (no).

Word War uses string variables, which must be defined with a specific length. Operation is similar to Number Attack except the bait and answer are read from the disk instead of coming from a random number generator. This program runs as long as there are still words to be read from the input file. The backspace key may be used to correct mistakes and the "enter" key must be used after each entry is completed.

The most obvious change needed by the program is the addition of at least one procedure because all Pascal programs should have them. Consider expanding Word War so that whole sentences or paragraphs can be processed instead of single words. Remember to use longer string variables and more of them. If you have a sound synthesizer, consider the use of synthesized words instead of or in addition

continued on page 209

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Market Trend
continued from page 205

ly modified to accommodate different file layouts.

Son of Market Trend Analyzer creates its output on any valid DOS file specification. The original was limited to screen or printer. The user may specify "CON" or "SCRN" to view program output on the display monitor. Specifying "LPT1" will create printed output.

The new program outputs a single line of information per input data point. The buy and sell signal is no longer produced on a separate line. The extra lines cause problems when the program's output is imported into a spreadsheet for graphic analysis.

In addition to the initial investment amount and number of curve smoothing days, Son of Market Trend Analyzer requests and uses load fee percent, exit fee percent, and number market days between values. The load fee is charged when switching into the stock based fund. The exit fee is charged when leaving the stock based fund. Since the number of market days between values

continued on page 207

```
...+....1....+....2....+....3....+....4....+....5....+....6....+....7....+...
86 12 16   1   36.14                    1936  32.30  32.16   0.14  5.70
86 12 17   2   35.82   -0.32            1918  31.98  31.87   0.11  5.70
86 12 18   3   35.68   -0.14            1912  31.84  31.77   0.07  5.70
86 12 19   4   36.06    0.38            1928  32.22  32.03   0.19  5.70
86 12 22   5   35.89   -0.17            1926  32.05  32.00   0.05  5.70
86 12 23   6   35.61   -0.28            1914  31.77  31.80  -0.03  5.70
86 12 24   7   35.69    0.08            1926  31.85  32.00  -0.15  5.70
86 12 26   8   35.74    0.05            1930  31.90  32.06  -0.16  5.70
86 12 29   9   31.93   -3.81    3.46    1912  31.55  31.77  -0.22  5.70
86 12 30  10   31.75   -0.18            1908  31.37  31.70  -0.33  5.70
86 12 31  11   31.61   -0.14            1895  31.23  31.49  -0.26  5.70
87  1  2  12   32.10    0.49    0.38    1927  32.10  32.01   0.09  5.70
87  1  5  13   32.60    0.50            1971  32.60  32.74  -0.14  5.70
87  1  6  14   32.76    0.16            1974  32.76  32.79  -0.03  5.70
87  1  7  15   33.19    0.43            1993  33.19  33.10   0.09  5.70
87  1  8  16   33.42    0.23            2002  33.42  33.25   0.17  5.70
87  1  9  17   33.57    0.15            2005  33.57  33.30   0.27  5.70
87  1 12  18   33.59    0.02            2009  33.59  33.36   0.23  5.69
87  1 13  19   33.63    0.04            2012  33.63  33.41   0.22  5.62
87  1 14  20   33.92    0.29            2035  33.92  33.79   0.13  5.54
87  1 15  21   34.38    0.46            2070  34.38  34.37   0.01  5.46
87  1 16  22   34.46    0.08            2077  34.46  34.48  -0.02  5.46
87  1 19  23   34.84    0.38            2103  34.84  34.91  -0.07  5.46
87  1 20  24   34.84    0.00            2104  34.84  34.93  -0.09  5.45
87  1 21  25   34.74   -0.10            2094  34.74  34.76  -0.02  5.43
87  1 22  26   35.64    0.90            2145  35.64  35.60   0.04  5.41
87  1 23  27   35.06   -0.58            2101  35.06  34.88   0.18  5.40
87  1 26  28   34.93   -0.13            2107  34.93  34.98  -0.05  5.39
87  1 27  29   35.62    0.69            2150  35.62  35.68  -0.06  5.31
87  1 28  30   35.95    0.33            2163  35.95  35.90   0.05  5.28
87  1 29  31   35.68   -0.27            2160  35.68  35.85  -0.17  5.27
87  1 30  32   35.55   -0.13            2158  35.55  35.81  -0.26  5.24
...+....1....+....2....+....3....+....4....+....5....+....6....+....7....+...
```

This is a sample PRN file

```
REM        TREND.BAS

REM ------------------------------------------------------------------------
REM Market Trend Analyzer
REM Copied from Computer Shopper Jan 1987 issue
REM Modified by Bob Moyers Jan 9, 1987
REM ------------------------------------------------------------------------

        CLS
        PRINT
        PRINT
        PRINT
        PRINT "                              Market Trend Analyzer"
        PRINT
        PRINT "   This program is designed to accept daily mutual fund or stock share prices,"
        PRINT "   and provide a calculated smooth curve.  Whenever the smoothed curve drops"
        PRINT "   below its previous value, a SELL signal is issued.  Whenever the smooth"
        PRINT "   curve turns upward from its previous value, a BUY signal is issued."
        PRINT
        PRINT
        PRINT
        PRINT
REM ------------------------------------------------------------------------
REM Get initial investment amount from user.  It must be positive.
REM
        WHILE INITINV$ <= 0
            INPUT "Please enter initial investment amount"; INITINV$
        WEND

REM ------------------------------------------------------------------------
REM Get number of market days between data values from user.  It must be
REM positive.  Compute the number of corresponding dividend days.
REM
        WHILE MKTDAYS% <= 0
            INPUT "Please enter number of market days between values"; MKTDAYS%
        WEND
        DIVDAYS% = (7 * (MKTDAYS% \ 5)) + (MKTDAYS% MOD 5)

REM ------------------------------------------------------------------------
REM Get the number of curve smoothing days from the user.  It must be at
REM twice as large as the number of market days between values.  Compute
REM the smoothing constant.
REM
        WHILE (SMOOTHCON$ <= 0) OR (SMOOTHCON$ >= 1)
            INPUT "Please enter number of curve smoothing days"; SMOOTHDAYS%
            SMOOTHCON$ = 2 * MKTDAYS% / SMOOTHDAYS%
        WEND

REM ------------------------------------------------------------------------
REM Get the load fee percent from the user.  It must be between 0 and 70%.
```

continued on page 208

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Market Trend continued from page 206

is a variable, the user can supply daily, weekly, or any other type of closing prices. Tracking the fund on a daily basis will result in greater accuracy of the program's advice. Obtaining daily closing prices is often as easy as making a daily toll free telephone call.

Explanation of Program

The program begins with a series of PRINT statements which inform the user of the program's purpose. Next, the initial investment amount is obtained from the user. The WHILE...INPUT...WEND structure provides a convenient way to ensure that the investment amount is greater than zero. The user is then queried for number of market days between data values. The response must be greater than zero. The number of corresponding dividend days is then computed using the formula

```
DIVDAYS% = (7 * (MKTDAYS% \ 5))
+ (MKTDAYS% MOD 5)
```

This formula converts 5 market days to 7 dividend days, 10 market days to 14 dividend days, etc. The number of dividend days will be used later in the program to compute interest earned while funds are residing in the money market account.

The number of smoothing days is then input. The number of smoothing days must be at least twice as large as the number of market days between data values. The smoothing constant is computed using the formula

```
SMOOTHCON# = 2 * MKTDAYS%
/ SMOOTHDAYS%
```

This is an approximation for the true smoothing constant, but is close enough for the purpose of this program.

The program then asks for load fee percent and exit fee percent. Both must be between zero and 70 percent. Zero is allowed, so that "no load" funds are supported.

The data file name is then obtained from the user, ".PRN" is appended to the user's reply, and the file is open for input. The user is then asked for the output file specification. The subroutine LCTOUC converts lowercase to uppercase within the output file specification. The number of print lines per page is computed based on the output device type. Three classes of output devices are supported: 1) display; 2) printer; 3) anything else. Output to display and printer will contain a page header for each physical page. If display output is being produced, then the program will pause at the end of each page. Output to other devices will contain the page header only once.

The page title is obtained from the user, and some variables are initialized. The main program loop begins with the WHILE NOT EOF (1) statement. This loop is executed once per line of input from the input data file. Data is extracted from the input line with the statements beginning from CUR.YEAR$ = MID$ (SHAREREC$,2,2) through and including CUR.INTEREST# = VAL(MID$(SHAREREC$,715)).

These lines would require changes if a different file layout is planned. Since the Lotus 1,2,3 "Print File" command places some blank lines in the PRN file, it's necessary to ignore the extra lines. The statement IF CUR.PRICE# = 0 THEN GOTO IGNORE accomplishes this.

If a distribution has been made, then it is necessary to adjust the old trend value. The old trend value is decreased by the percentage the distribution is to the old share price. For example, if the distribution represents 10% of the old share price, then the old trend value is reduced by 10%. This adjustment is necessary in order to prevent a false sell signal from being generated.

If a distribution has been made, then the distribution is reinvested into the stock based fund. The earned shares are computed by the statement:

```
ERN.SHARES# = (CUR.DISTR# * CUR.SHARES#) / CUR.PRICE#
```

The result is rounded to three decimal places, and added to the current number of shares held.

The current trend value is computed and compared to the previous trend value. If the trend curve has changed from a downward direction to an upward direction, then a BUY signal is generated. If the trend curve has changed from an upward direction to a downward direction, then a SELL signal is generated. Notice that no signal is generated unless at least ten data values have been read. If a buy is signalled, then the funds in the money market are used to purchase shares of the stock fund. Any load fee is charged at this time. If a sell is signalled, then the stock fund shares are liquidated into the money market account. Any exit fee is charged at this time.

The account value is computed according to where the money is currently parked: money market or stock fund. If funds are in the money market, then interest is added to the account for the proper number of dividend days. A single print line is generated for each data line. ●

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Market Trend Program continued from page 206

```
REM Zero is allowed.
REM
      LOADPCT# = -1
      WHILE (LOADPCT# < 0) OR (LOADPCT# > 70)
         INPUT "Please enter load fee percent"; LOADPCT#
      WEND

REM -----------------------------------------------------------------------
REM Get the exit fee percent from the user.  It must be between 0 and 70%.
REM Zero is allowed.
REM
      EXITPCT# = -1
      WHILE (EXITPCT# < 0) OR (EXITPCT# > 70)
         INPUT "Please enter exit fee percent"; EXITPCT#
      WEND

REM -----------------------------------------------------------------------
REM Get the data file name from the user.  Add .PRN and open the data file.
REM
      WHILE FILENAME$ = ""
         INPUT "Please enter data file name (.PRN will be added)"; FILENAME$
      WEND
      OPEN FILENAME$+".PRN" FOR INPUT AS #1

REM -----------------------------------------------------------------------
REM Get the output file specification from the user.  Convert reply to all
REM upper case. Determine page size according to type of output device.
REM Open the output file specification.
REM
      WHILE OUTSPEC$ = ""
         INPUT "Please enter output spec"; OUTSPEC$
      WEND
      GOSUB LCTOUC
      IF (MID$(OUTSPEC$,1,3) = "CON") OR (MID$(OUTSPEC$,1,4) = "SCRN") THEN
         DIS$ = "Y"
         PAGESIZE% = 18
      ELSE
      IF (MID$(OUTSPEC$,1,3) = "LPT") THEN
         LPT$ = "Y"
         PAGESIZE% = 50
      ELSE
         PAGESIZE% = 32767
      END IF
      END IF
      OPEN OUTSPEC$ FOR OUTPUT AS #2

REM -----------------------------------------------------------------------
REM Get page title from user
REM
      INPUT "Please enter page title"; PAGTITLE$

REM -----------------------------------------------------------------------
REM Initialize variables for later use.
REM
      COUNT% = 1
      OLD.TREND# = 0
      OLD.PRICE# = 0
      CUR.TREND# = 0
      CUR.ACCT# = INITINV#
      LINES% = 0

REM -----------------------------------------------------------------------
REM Begin main program loop, which is executed once per input data record.
REM
      WHILE NOT EOF(1)
         LINE INPUT #1, SHAREREC$

REM -----------------------------------------------------------------------
REM Get data from input record.
REM
         CUR.YEAR$  = MID$(SHAREREC$,2,2)
         CUR.MONTH$ = MID$(SHAREREC$,5,2)
         CUR.DAY$   = MID$(SHAREREC$,8,2)

         IF LEFT$(CUR.MONTH$,1) = " " THEN
            MID$(CUR.MONTH$,1,1) = "0"
         END IF

         IF LEFT$(CUR.DAY$,1) = " " THEN
            MID$(CUR.DAY$,1,1) = "0"
         END IF

         CUR.DATE$ = CUR.MONTH$+"/"+CUR.DAY$+"/"+CUR.YEAR$

         CUR.PRICE#    = VAL(MID$(SHAREREC$,16,6))
         CUR.DISTR#    = VAL(MID$(SHAREREC$,32,6))
         CUR.INTREST# = VAL(MID$(SHAREREC$,71,5))
         CUR.SIGNAL$ = ""

REM -----------------------------------------------------------------------
REM Ignore "noise" records.
REM
         IF CUR.PRICE# = 0 THEN GOTO IGNORE

REM -----------------------------------------------------------------------
REM If a distribution has been made, then adjust the old trend value and
REM increase the number of shares owned.
REM
         IF CUR.DISTR# <> 0 THEN
            PCT.DISTR# = CUR.DISTR# / OLD.PRICE#
            COR.TREND# = OLD.TREND# - (OLD.TREND# * PCT.DISTR#)
            OLD.TREND# = COR.TREND#
            IF CUR.SHARES# > 0 THEN
               ERN.SHARES# = (CUR.DISTR# * CUR.SHARES#)  / CUR.PRICE#
               ERN.SHARES# = INT(ERN.SHARES# * 1000 + .5) / 1000
               CUR.SHARES# = CUR.SHARES# + ERN.SHARES#
            END IF
         END IF

REM -----------------------------------------------------------------------
REM First time in, set old trend value to current price.
REM
         IF COUNT% = 1 THEN
            OLD.TREND# = CUR.PRICE#
         END IF

REM -----------------------------------------------------------------------
REM This is the main trend value formula.
REM
         CUR.TREND# = OLD.TREND# + (CUR.PRICE# - OLD.TREND#) * SMOOTHCON#

REM -----------------------------------------------------------------------
REM See if a buy or sell is to be signalled, but generate no signals the
REM for the first ten observations.
REM
         IF COUNT% > 10 THEN
            IF (CUR.TREND# > OLD.TREND#) AND (CUR.SHARES# = 0) THEN
               CUR.SIGNAL$ = "BUY"
            END IF

            IF (CUR.TREND# < OLD.TREND#) AND (CUR.SHARES# <> 0) THEN
               CUR.SIGNAL$ = "SELL"
            END IF
         END IF

REM -----------------------------------------------------------------------
REM Save the current trend value and share price
REM
         OLD.TREND# = CUR.TREND#
         OLD.PRICE# = CUR.PRICE#

REM -----------------------------------------------------------------------
REM If a buy is signalled, then compute the number of shares to purchase,
REM taking into account the load fee.
REM
         IF CUR.SIGNAL$ = "BUY" THEN
            CUR.SHARES# = (CUR.ACCT# / CUR.PRICE#) * (100 - LOADPCT#) / 100
            CUR.SHARES# = INT(CUR.SHARES# * 1000 + .5) / 1000
         END IF

REM -----------------------------------------------------------------------
REM If a sell is signalled, then liqudate the shares, taking into account the
REM exit fee.
REM
         IF CUR.SIGNAL$ = "SELL" THEN
            CUR.ACCT# = (CUR.SHARES# * CUR.PRICE#) * (100 - EXITPCT#) / 100
            CUR.SHARES# = 0
         END IF

REM -----------------------------------------------------------------------
REM Compute the account value according to whether we are in the stock fund
REM or money market fund.
REM
         IF CUR.SHARES# = 0 THEN
            CUR.ACCT# = CUR.ACCT# + (CUR.ACCT# * (CUR.INTREST# / 36500!) * DIVDAYS%)
         ELSE
            CUR.ACCT# = CUR.SHARES# * CUR.PRICE#
         END IF

         CUR.ACCT# = INT(CUR.ACCT# * 100 + .5) / 100

REM -----------------------------------------------------------------------
REM Print a single line of output.
REM
         LET COUNT% = COUNT% + 1
         GOSUB NEWPAGE
         PRINT #2, USING "\      \ \    \ ####.##  ###.##  ####.##  ####.###  ##.##
         ########.##";
             CUR.DATE$; CUR.SIGNAL$; CUR.PRICE#; CUR.DISTR#; CUR.TREND#, CUR.SHARES#;
         CUR.INTREST#; CUR.ACCT#
         LINES% = LINES% + 1


REM -----------------------------------------------------------------------
REM This closes the main program loop
REM

IGNORE:
      WEND

REM -----------------------------------------------------------------------
REM All done, finish last page.
REM
      LINES% = -1
      GOSUB NEWPAGE
      END


REM -----------------------------------------------------------------------
REM This routine converts lower case to upper case.
REM

LCTOUC:
      FOR CX = 1 TO LEN(OUTSPEC$)
         IF (ASC(MID$(OUTSPEC$,CX,1)) >= 97) AND (ASC(MID$(OUTSPEC$,CX,1)) <= 122) THEN
            MID$(OUTSPEC$,CX,1) = CHR$(ASC(MID$(OUTSPEC$,CX,1))-32)
         END IF
      NEXT
      RETURN

REM -----------------------------------------------------------------------
REM This routine generates page headers and page footers.
REM

NEWPAGE:
      IF (DIS$ = "Y") AND ((LINES% > PAGESIZE%) OR (LINES% = -1)) THEN
         LOCATE 25,1
         INPUT "Press ENTER to continue"; NULL$
      END IF

      IF (LINES% > PAGESIZE%) OR (LINES% = 0) THEN
         IF DIS$ = "Y" THEN
            CLS
         ELSEIF LPT$ = "Y" THEN
            PRINT #2, CHR$(12)
         END IF
         PRINT #2, PAGTITLE$;" for ";SMOOTHDAYS%;" smoothing days"
         PRINT #2, " "
         PRINT #2, "  DATE    SIGNAL   SHARE   DISTRI   TREND    SHARES    MONEY    PRESENT  "
         PRINT #2, "                   PRICE   BUTION   VALUE             MKT %     VALUE   "
         PRINT #2, "--------  ------  -------  ------  -------  --------  -----  -----------"
         LINES% = 0
      END IF
      RETURN
```

Word Certain 1.00—The Ultimate Word Processor?

Reviewed by Fred Blechman

My friend, Mel Marcus, is a software freak! When he had his Commodore 64 he collected hundreds of public domain and shareware programs. Now he's doing the same with his IBM PC/XT clone. His "bible" is the huge 8½-inch x 11-inch x 1¾-inch thick 924-page Dilithium Press book, *The IBM PC (and compatibles) Free Software Catalog and Directory*, by Robert A. Froelich ($17.95, ISBN 0-517-56112-3).

For those programs normally sold, Mel has become an expert by collecting all the books that explain the program documentation.

So, when Mel called me the other day and said, "Fred, I've finally found it! I found it!" he got my attention.

"What did you find, Mel? I didn't know you were looking for anything."

"Oh, yes!" he explained. "Ever since I started using microcomputers, I've been looking for a great word processor. I've found some good ones, but they were always too complicated. I do a lot of writing in my business, and I need something fast and simple.

"With the Commodore I used Paper Clip," he continued. "But now that I've focused on the IBM PC world, there are so many word processors to choose from, it's bewildering. Of course, there's WordStar and all its workalikes. I've tried MultiMate, VolksWriter, Leading Edge, WordVision, LeScript, The Word, Word Perfect and just about every one around. In the shareware world, I found PC Write to be about the most powerful.

"But," he continued, "they are all either too limited or too complicated. The manuals are hundreds of pages long. Printer installations can drive you bananas. And just about the time you learn how to use one of these word processors, they put out a new version that won't read the old text files!"

"I know what you mean," I replied. "But you have finally found one you like? Tell me about it."

"Well," Mel started out, "it's called Word Certain 1.0. I've never seen it advertised, but I heard about it at this computer club. Best of all, it's not even shareware—it's public domain, so you don't even have to pay anyone to use it! I've got it on disk. You can come over and run the disk yourself. It's fabulous! I even wrote out a list of features that..."

"Hold it," I interrupted. "Can you send me that list? I'm doing an article for *Computer Shopper* right now, and the deadline has already passed."

continued on page 210

Turbo Pascal

continued from page 205

to displayed words on the screen. You may want to use the speaker in your computer to make long and short beeps and use them in a Morse Code practice program. Don't forget to add graphics to your final version and take advantage of color capability, if available. The potential uses of this program are only limited by your imagination and hardware. Interactive fiction and programmed learning applications, complete with sound and graphics, are relatively easy to implement with derivatives of Word War.

Special modifications to Number Attack and Word War are available at reasonable cost by writing to Pascal Headquarters, 3148 Holmes Ave. So., Minneapolis, MN 55408-2629 and a disk is available for $5.00 (including postage) that contains my programs in Turbo Pascal and Microsoft QuickBASIC, including Paragraph Pillage, Character Font and Graphics Editors, Multiple Column and Booklet Printing Programs and new wonders I haven't developed yet. ●

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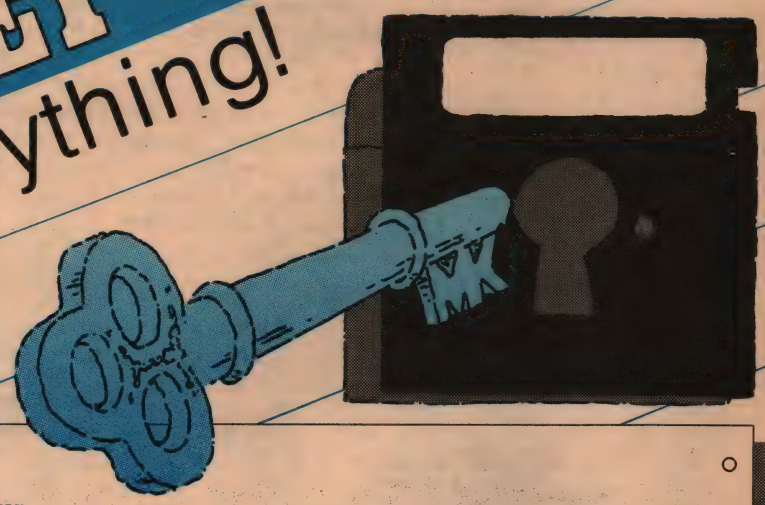

```
A>DEBUG
-N PROGRAM.COM
-L
-D 100 129
33CB:0100  EB 0B 40 05 56 65 72 73-20 31 2E 38 31 50 B4 30   k.@.Vers 1.81P40
33CB:0110  CD 21 86 E0 3D 36 01 72-05 3D 0A 02 76 09 BA CB   M!.`=6.r.=..v.:K
33CB:0120  03 B4 09 CD 21 CD 20 58-EB 2F                     .4.M!M Xk/
```

turn this:

into this

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Without MASTER*KEY, how long do you think it would take to find out this program wasn't running because you had the wrong version of DOS?

```
OFST  ASCII  OBJCODE     SRCECODE
                         ;Program:  PROGRAM.COM
0100         EB0B        H0100:  JMP     H010D
                         ;-----------------------------------------
0102         40                  INC     AX              ;NON-BRANCHED CODE
0103  Ve     055665              ADD     AX,6556h
0106  rs     7273                JB      H017B  ;. . . . . .
0108  1      2031                AND     [BX+DI],DH
010A  .      2E                  DB      2Eh
010B  81     3831                CMP     [BX+DI],DH
                         ;-----------------------------------------
010D  P      50          H010D:  PUSH    AX
010E  0      B430                MOV     AH,30h
0110  !      CD21                INT     21h             ;get DOS Version#
0112         86E0                XCHG    AL,AH
0114  =6     3D3601              CMP     AX,0136h
0117  r      7205                JB      H011E  ;. . . . . .
0119  =      3D0A02              CMP     AX,020Ah
011C  v      7609                JBE     H0127  ;. . . . . .
011E         BACB03      H011E:  MOV     DX,03CBh
0121         B409                MOV     AH,09h
0123  !      CD21                INT     21h             ;display string, DX
0125         CD20                INT     20h             ;terminate normally
                         ;-----------------------------------------
0127  X      58          H0127:  POP     AX
0128  /      EB2F                JMP     H0159
                         ;-----------------------------------------
```

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SuperMac Software Announces SuperLaserSpool

SuperMac Software, a newly created division of SuperMac Technology, has announced the development of a new Macintosh spooler for all Apple printers. The SuperLaserSpool, was showcased during the MacWorld Exposition. Nearly one hundred other companies used the product at the MacWorld show.

SuperLaserSpool outperformed other Macintosh spoolers by a speed factor of 6 to 20 in recent benchmark tests. For example, when printing a 6-page Excel spreadsheet, SuperLaserSpool completes the printing in 10 seconds. The same document printed using competing spoolers occupies the Macintosh for 1 minute and 45 seconds before the computer is free to use again. Additionally, SuperLaserSpool handles downloaded fonts and is available in a multi-user version.

SuperLaserSpool solves the speed issue through an intelligent background processing program that manages the entire process, according to John Duhring, general manager of SuperMac Software. Other spooling programs convert QuickDraw files into intermediary files prior to freeing the Macintosh from its printing tasks. SuperLaserSpool writes QuickDraw-based print files directly to disk and manages the entire conversion process in the background. This means an automatic, transparent conversation between the Macintosh and the LaserWriter eliminating the need for the user to wait.

Additionally, the program writes disk files that are one-fifth to one-tenth the size of those created by the competition. To illustrate this point, a 2.5 page WriteNow spool file containing both text and graphics creates a 7.5K document using SuperLaserSpool compared to the 157K required by a competitive spooler—a savings of over 135K of space when using SuperLaserSpool.

SuperLaserSpool will retail for $149.95. Orders are now being accepted.

For more information contact: SuperMac Software, 950 N. Rengstorff Avenue, Mountain View, CA 94043; (415) 964-8884. ●

Word Certain
continued from page 209

"Sure, Fred. I'll drop it in the mail tonight."

A couple of days later I received the list from Mel. It's shown here in Table 1. I was impressed. I called Mel.

"Mel, you say you have Word Certain on disk. Can you send me a copy? I'd like to see for myself. I find it hard to believe. Can it really do all those things on your list?"

"Hey, Fred, it's unbelievable! Everyone has been after me for copies and it's been driving me crazy. I don't make a nickel on this. I'm out of blank disks and mailers. Why don't you come over and I'll let you run the disk?"

My curiosity was at a peak. Maybe I could write about this discovery for *Computer Shopper*. Stan Veit loves new stuff! So I made an appointment with Mel and went to his place.

When I got there a simple note was pinned to the door: "Fred: Had to leave for a few minutes. Come on in. The disk is by the computer."

I went inside, and there was a disk marked "Word Certain 1.0" alongside the IBM PC/XT clone. I used Mel's MSDOS 3.2 to boot up the computer in Drive A, then replaced the MS-DOS disk with the Word Certain disk.

I typed DIR and the screen showed a bunch of files like WC.EXE, WCINSTAL.-COM, WCHELP.DOC and README.1ST. I've learned to look for README files, since they usually have the latest information. So I typed TYPE README.1ST and pressed ENTER. The screen displayed a message:

Look at the calendar on the wall, then turn around.

I looked at the calendar, it said April 1. I turned around to see Mel standing there, grinning, and holding out a yellow pad and a slim, yellow pencil with a nice ruby eraser on top.

"Here's Word Certain 1.0. Like I told you, it's unbelievable..."

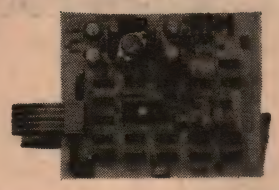
*******Word Certain 1.00 Main Features*******
(Compiled by Mel Marcus)

1. Instant access. No waiting for DOS to load.
2. All commands internal. No accessing disk for commands or overlay programs.
3. 270K storage capacity (about 45,000 words, or 180 double-spaced pages).
4. Each character immediately stored to reduce chance of data loss.
5. Instant error correction with utility (included).
6. Full search and replace functions.
7. Huge thesaurus and dictionary available for easy access.
8. Freely mixes text and graphics.
9. Prints out in selected colors.
10. Simple, easily understood commands.
11. Produces upper and lowercase English and foreign characters.
12. Prints in many different fonts and sizes.
13. Does not require special printer installation or paper feed mechanism.
14. Subscripts, superscripts, underlining, bold, enhanced.
15. Insert, delete, indents and other formatting functions.
16. Cut and paste for block moves.
17. Page numbering, headers and footers as required.
18. Automatic spelling checker.
19. Add files from Lotus, dBase and other popular programs.
20. Can be modified by user without learning new language.
21. Easily transportable between different computers.
22. Does not conflict with memory-resident programs.
23. Multitasking. Can be used while computer is running a background program.
24. Data easily duplicated and shared with other users.
25. Can also create spreadsheets, forms, and databases with no additional software.

Table 1

MS-DOS, CP/M EPROM PROGRAMMING SYSTEM

2708, 2758, 2716, 2516, 2532*, 2564*, 68764*, 2816A
2732/A, 2764/A, 27128/A, 27256, 27512, 27CXXX, 2864A, 8751UC*



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- PROGRAM EPROM(S) FROM RAM - READ EPROM(S) INTO RAM - COMPARE EPROM W/RAM
- VERIFY EPROM IS ERASED - COPY EPROM - MONITOR MODE
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IBM PC-AT 512K w/1.2 Drive	CALL	Epson FX-286	$510
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Call for other IBM products		American color monitor (color/green)	$295
		NEC Multisync	$550

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Compaq Deskpro 128K w/1 drive	$1525	Everex Modem (1200B)	$120
Compaq Portable II model 4	$3499	20MB Hard Disk (ST225) w/controller	$375
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Compaq Deskpro 386	Call	Irwin 20 MB Tape Back-Up with tape	$375
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Engineering Analysis Package For the Macintosh

MacNeal-Schwendler Corporation has premiered the first comprehensive engineering analysis package yet available for the Apple Macintosh.

Called MSC/pal for the Macintosh, the package performs both static and dynamic finite element analysis and takes full advantage of the Macintosh user interface, with pull-down menus and dialog boxes. The new software is similar to the company's popular IBM PC-based MSC/pal products.

MSC/pal uses the finite element analysis method (FEM), in which a structure or mechanical component is broken into a number of discrete elements that can be computer-analyzed for tolerance to stress, vibration, pressure, and temperature. The use of FEM computer-based analysis not only optimizes product design, but also streamlines the development process and reduces reliance on costly prototyping and testing to eliminate design flaws.

Applications of MSC/pal include design and analysis of mechanical systems, stress analysis of mechanical components, servo-mechanism vibration analysis, stress analysis of pressure vessels, vibration analysis of printed circuit boards, automotive and aerospace structural strength analysis, and machinery vibration analysis.

MSC/pal performs static, natural frequency, transient response analysis on both 3-D and 2-D models. The program's element library includes beams, quadrilateral and triangular plates, plane stress and plane strain membranes, scaler springs, masses, dampers, and generalized mass and stiffness matrices. Applied loads consist of nodal forces and moments, gravity, pressure, and enforced displacements and accelerations.

The MSC/pal interactive graphics capabilities include 3-D wireframe plotting, scaling and rotating, deformed/-undeformed overlays, element and node point numbering, and XY plotting for element stress scanning and dynamic response. Deformed animation allows the user to animate the deformed shape of the model.

Two versions of MSC/pal for the Macintosh are immediately available: one for the 512K Macintosh, priced at $995, and another for machines with 1 megabyte of memory, priced at $1495. The only difference between the two is that the larger version can analyze models with as many as 500 node points, whereas the 512K version has a maximum node point limit of 300. Both versions also run on the Macintosh Plus. Neither version of MSC/pal is copy-protected. A 25-node executable demonstration program with full documentation is available for $45, which is applicable towards the purchase price of the full system.

For more information contact: The MacNeal-Schwendler Corporation, 815 Colorado Boulevard, Los Angeles, California 90041. 213-258-9111; Telex 4720462 MSC. ●

Mac•Man Brings Joystick Connection To The Mac

Nuvo Labs has introduced the Arcade•Adapter/Mac•Man, a solid state plug device and action arcade game for the Apple Macintosh. The Arcade•Adapter allows the connection of joysticks to the Mac's mouse port. Mac•Man depicts the continuing saga of Mac•Man and his battles with other major PCs.

The $29.00 package from Nuvo includes the adapter and a clever arcade game program called Mac•Man. The game plays on the famous rivalry between Apple Computer and the other major PCs with screen images of the popular computers locked in a battle for domination of the screen.

The Arcade•Adapter is a

continued on page 212

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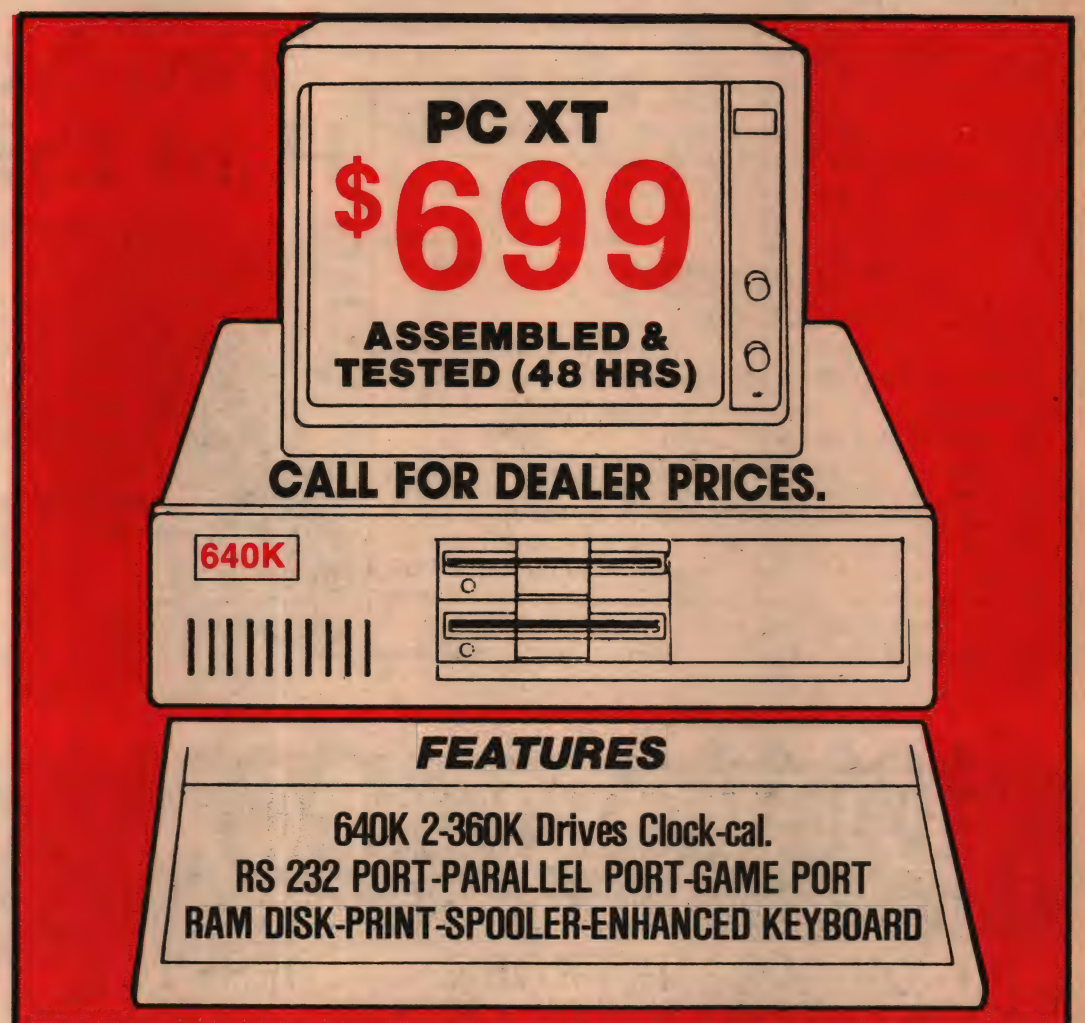

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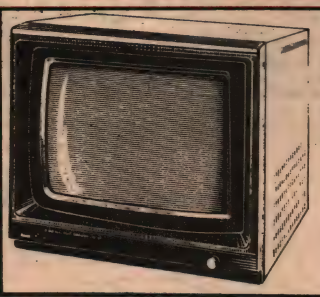

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InBox for Mac No Longer Requires Dedicated Server

The new version 1.5 of InBox for the Mac, the pioneering desktop communications software package from THINK Technologies, Inc., now can run "in the background" without requiring a dedicated server. This facilitates its use on small networks of fewer than 10 Macintoshes. InBox can also now be used on large mail systems of over 100 mailboxes.

A version of InBox for IBM PCs and compatibles is being readied for shipment in the first quarter of 1987.

InBox for the Mac, introduced in June 1986, allows users to create, send and receive memos, messages and files. It is being used at many Fortune 500 companies. Apple Computer, Inc., through its first-ever site license with a third-party software vendor, currently has nearly 2000 copies in use throughout the company. Apple Chairman & CEO John Sculley regularly relies on it himself. Sculley believes that "the interconnectivity between Macintosh and PC networks made possible by InBox, and other network products like it, will allow more Macintoshes to enter the corporate environment."

Release 1.5 of InBox for the Mac will be usable by as few as two people. This can be done by optionally running the message center in the background, rather than on a separately dedicated Mac. The message center machine is then available for use on other tasks. For larger networks, of over 100 users, Release 1.5 allows users to exchange information through many different message centers on their network, or on other networks connected via "bridges" or "gateways." It is scheduled to ship this spring.

InBox for the Mac is priced at $350 for a starter kit and $125 per connection. Volume discounts will be available for multiple connection purchases and a discount schedule will be established for dealers, major accounts, and educational institutions.

For more information contact THINK Technolgies, Inc., 420 Bedford Street, Lexington, MA 02173; 617-863-5590. ●

Mac • Man
continued from page 211

durable solid-state unit that plugs between the joystick and the mouse port on the back of the Macintosh computer. The supporting software can automatically install itself, and may be transferred easily to other programs as a Macintosh desk accessory. The joystick operation is automatically invoked by plugging the Arcade•Adapter in, and may be adjusted through the pull-down desk accessory.

The Mac•Man arcade game is a natural for computer users. Based on familiar arcade-action games, most people already know how to play it. It is tongue-in-cheek humor combined with hot arcade action—perfect for the computer game player in all of us.

Nuvo Labs is working with other game developers to include the Arcade•Adapter in their games. In addition, the joystick will operate most existing Macintosh software.

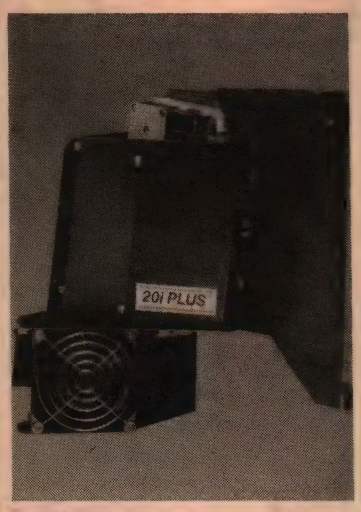
The Mac•Man program is not copy-protected, and both Mac•Man and the Arcade • Adapter software may be copied freely. Company officials note that both provide complete enjoyment when used with a joystick and the Arcade-•Adapter.

Mac•Man works with Macintosh 512K or Macintosh Plus computers. The Arcade•-Adapter will operate on any Macintosh. The package is shipping now with a suggested retail price of $29.00.

For additional information contact Nuvo Labs, 225 Tank Farm Road, San Luis Obispo, CA 93401.

Mention that you read about it in *Computer Shopper*. ●

Two New SCSI Internal Hard Drives From Rodime



Rodime, Inc., Peripheral Systems Division has announced two new hard disk drives for the Apple® Macintosh Plus. The Rodime 20I Plus and 45I Plus are 20 and 45 megabyte internal disk drives for the Apple Macintosh Plus. Both drives use the Mac Plus' high speed SCSI (Small Computer Systems Interface) connector port, making them up to ten times faster than the Mac Plus' floppy drive and up to six times faster than hard drives that use the floppy port.

Both products have a unique heat-dissipating design. The self-contained cabinet has a fan, controller, and drive, which when installed, creates a sealed air passageway. The fan draws cool air from beneath the Mac, over the Mac's motherboard, over the drive and its power supply, and through a "chimney" to be expelled at the top of the Mac. Rodime has found this design lowers the ambient air temperature of the Mac 15° to 20° F under normal conditions.

Both drives have easy to use FileGuard software to back up data onto floppies. The Rodime 20I Plus and 45I Plus are fully arbitrating, which doubles throughput when using multiple SCSI peripherals. Two SCSI ports allow daisy-chaining of up to six additional external SCSI peripherals. The drives are 100% compatible with Apple SCSI implementation.

When installed, no cumbersome modifications need to be made to the Mac Plus or the drive. Qualified dealers will be able to install in less than 15 minutes.

The units each have independent power supplies and embedded drive controllers to handle all error correction and disk management by sector. Self-diagnostics identify and flag twenty-eight different fault conditions in the drive, controller or power supply. Both drives have a full one year limited warranty. The units are fully shock-mounted.

Suggested retail price is $1,295 for the 20I Plus and $1,695 for the 45I Plus.

For more information contact Rodime Inc., Peripheral Systems Division, 29525 Chagrin Boulevard, Suite 214, Pepper Pike, Ohio 44122; (216) 765-8414.

Mention that you read about it in *Computer Shopper*. ●

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Industry Supports continued from page 104

cessor to showcase AppleShare—Microsoft Word Version 3.0," said Peter Friedman, marketing manager for desktop communications at Apple.

Microsoft Word On The AppleShare Network.

Microsoft Word Version 3.0 for Macintosh systems combines features of high-end personal computer-based word processing programs with the ease of use and graphical user interface of the Macintosh. The result is high-speed software that makes it very easy to prepare professional-looking documents ranging from memos to long reports that combine text and graphics.

Collaboration with Apple ensured that Microsoft Word Version 3.0 was designed to be AppleShare network aware. It was optimized for the AppleShare network by including special features such as file sharing. A read-only mode can be specified in Word's dialog box so that users in a work group can review the same document without altering the original. The software can be installed on the file server and accessed simultaneously by several users.

Microsoft Word is ideally suited to the network environment in several ways. Significant Microsoft Word features, like style sheets, glossaries, and dictionaries, have been specially adapted so they can be shared and used by everyone on the network. In an office that uses Microsoft Word on a network, a common format for interoffice memos or letters can be designed and then utilized by everyone on the network. Microsoft Word glossaries, which allow users to store frequently used text and graphics, also can be shared in the networking version, thus increasing the productivity of the work group. With the spelling corrector included with Microsoft Word, specialized dictionaries can be created that all users can access to check their documents. A user also can create a custom dictionary that can be shared or stored locally at the workstation.

Microsoft Word Version 3.0 has been tested for use with the MacServe file server as well as the AppleShare server. According to David Baasch, product manager for MacServe at Infosphere, Microsoft Word 3.0 is extremely well-behaved as a network application. "We know all the ways a software package can fail in a networked environment, and Word 3.0 for the Macintosh passes all the tests. It's a perfect shareable package," said Baasch.

When combined with an Apple LaserWriter, Microsoft Word Version 3.0 produces the best-looking output available from any personal computer-based word processing program. When used on a network, users can produce professional-quality documents while sharing the cost of the peripheral.

Pricing And Availability

The standalone version is AppleShare network aware; no additional word processing network software is needed. Microsoft Word Version 3.0 for the Macintosh, requires a minimum of 512K memory and is not copy-protected. Microsoft Word has a suggested retail price of $395. This licenses a standalone user or one user on a Macintosh network. As users are added to the network, each must license a separate package.

Microsoft Corporation (NASDAQ "MSFT") develops, markets, and supports a wide range of software for business and professional use, including operating systems, languages, and application programs, as well as books and hardware for the microcomputer marketplace.

For more information contact Microsoft Corporation, 16011 NE 36th Way, Box 97017, Redmond, Washington 98073-9717.

Macintosh To Vax Integration Via Ethernet

Pacer Software, Inc. of La Jolla, California, announced immediate availability of its high speed Macintosh to VAX integration software. Pacer's pcLINK for the Macintosh was

continued on page 216

K.J.T. INFOSTAR tm

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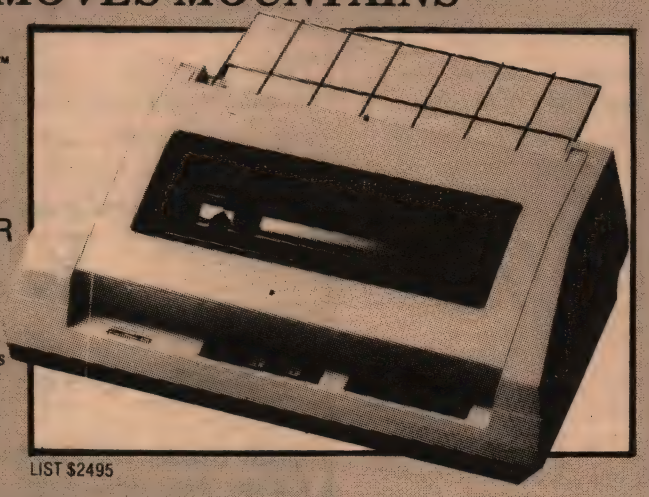

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This stupendous brute of a printer will make short work of even your largest spreadsheets and reports. You will surprise yourself and amaze your friends and colleagues with this super printer performing in your office. Don't miss out on this one!

CR-420 Ribbon Cartridges $16.95 each
Call for Quantity Savings

SPECIFICATIONS

Carriage Width: 132 Columns (at 10 pitch)

Print Method: Impact dot matrix, bidirectional, logic seeking in both text and graphics

Print Speed: 420 CPS/Draft; 104 CPS/Correspondence Quality; 2500 dots/sec. – standard graphics; 1250 dots/sec – high-density graphics

Print Head: 8-pin, staggered arrangement

Character Sets: Standard 96 ASCII printing in 17 fonts

Line Spacing: n/180 (n=0-255)

Paper Feed: Pin feed (paper width adjustable) and built-in friction feed

Paper Width: 5" to 15" (pin feed); Up to 16" (feed)
Paper Path: Rear and bottom entry

Paper Thickness: Original plus 4 copies (5-part)

Ribbon: Cassette style, single color (black)

Interfaces: Parallel – Centronics-style; and Serial –RS232C Asynchronous

Baud Rate: 1200, 2400, 4800, 9600; switch selectable

Protocols: X-ON/X-OFF, READY/BUSY, ETX/ACK, switch selectable

Buffer: 18K

Reliability: MTBF – 800 hours continuous printing; MCBF – 200 million characters; MTTR – 30 minutes

Power: 117 VAC ± 10%, or; 220 VAC ± 10%, 50/60 H_z

Power Consumption: 55W (Standby); 175W (Operating at self test print); 250W (Operating at heaviest duty)

Environmental Limits: Temperature (operating) 5°-40°C; 40°-105°F; Humidity (operating) 20-80%

Dimensions: 595mm (W) x 194mm (H) x 405mm (D); 23.4" (W) x 7.6" (H) x 15.9" (D)

Weight: 27kg; 60 lbs.

CR 420 Ribbon Cartridges $16.95 each BUY 12+ at $13.45 each

36 CPS DAISYWHEEL PRINTER...

Mechanically identical to the Brother HR-35

- **Superior Performance**
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- **Continuous Duty Cycle**
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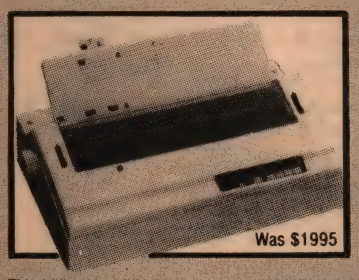

Was $1995

Your Price Just

$399

2+ $369
3+ $349

This bidirectional, logic seeking marvel lets you adjust the hammer intensity to print anything from single-page letters to five-part forms with equal clarity. A variety of impressive typestyles give you added print versatility.

It is exceptional in many other ways. The 15½" wide carriage briskly prints all your ledgers, spreadsheets, and extra wide business graphics with ease. With the optional cut sheet feeder and tractor feeder, you can print several copies on your letterhead and switch to pin-fed paper for high volume word or data processing.

The 7K buffer holds a substantial amount of data while its printing.

The average life of the print wheel is 10 million characters. Which means that you can run it eight hours a day — every day of the week — for almost two full years. Of course, under more normal usage, it will handle your business correspondence and graphics for up to five full years without service. That's impressive.

Quiet quality.
What your eyes don't tell you, your ears will. Because this printer is much quieter than many more expensive printers. So you can keep the noise down while you keep the cost down.

Specifications

Print Speed	36 CPS (Shannon text)	Interface	Standard RS-232C – Serial
Print Wheel	96 petals/wheel, cassette type, ASCII stand.		
Print Wheel Life	10 million char./wheel	Buffer Size	7K
Characters/Line	132 characters (1/10"), 158 characters (1/2"), 198 characters (1/15")	Control Panel	Indicators: Select, Power, Alarm, Line, Pitch, and Copy (LEDs) Switches: Select, Line Feed, TOF, Line, Pitch, and Copy
Paper Width	16.5 in max (419 mm)		
Copy Capacity	Original (45 kg) + 4 copies (15 kg) (total thickness 0.35 mm max.)	Noise	Operating – Less than 65 dB
		Temperature	50 to 105 F – 10 to 40 C (operating)
Carriage Motion	Bidirectional, logic seeking	Humidity	20% to 80% non-condensing (operating) 5% to 90% non-condensing (storage)
Carriage Rtrn Speed	750 ms (at 13.2" return)		
Line Spacing	6, 4, 3 lines/inch, 1/48" proportional increments	Power	120 V, 60 Hz (Optional: 120 or 220 - 240 V, 50/60 Hz) 130 W Max.
Paper Feed	Bidirectional, logic seeking		
Paper Feed Speed	4"/second	Dimensions	21.18 (W) x 7.65 (H) x 15.15 (D) inches (538(W) x 194.5 (H) x 385 (D) mm)
Available Ribbons	Ribbon Life		
Single-strike black carbon film	60,000	Weight	33 lbs (15 kg)
Multi-strike black carbon film	150,000	Optional Features	Tractor feeder, Auto Cut Sheet Feeder, Single and Multi-strike ribbons, Interchangeable printwheels (Numerous languages and typestyles)
Single-strike black correctable film	70,000		
Multi-strike black fabric	500,000		
Single-strike red film	2,000		
Correction tape	1,500		

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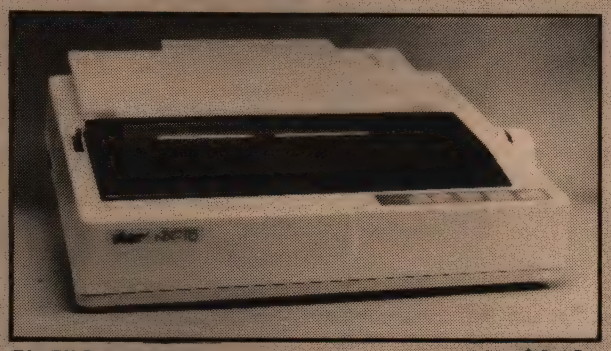


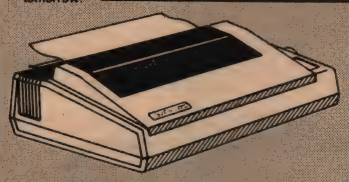
Big 5K Print Buffer

List $349

If you are looking for a top quality printer at an affordable price, you've found both in the new Star NX-10. The NX-10 operates bi-directionally at 120 CPS and includes many special features such as near letter quality printing, a huge 5K print buffer and easy access format switches for a wide range of character modes and character sets. You get friction feed for single sheets and tractor feed for fanfold paper. Another special feature is IBM graphics printer emulation.

All this makes the new NX-10 versatile enough for home or office. The NX-10 is easily interfaced with all popular computers such as IBM, Apple, Atari, Commodore, Sanyo and Zenith. Breakdowns are virtually unheard of with the NX-10. It is manufactured by a leading company with over thirty-five years of micro-precision experience for quality and reliability.

Whatever your personal computer...Star's NX-10 provides reliable and flexible performance meeting your needs today...and tomorrow.



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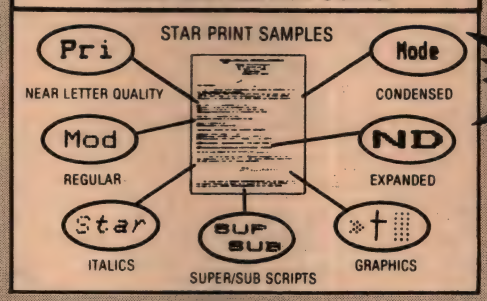

Fine Near-Letter-Quality, 100% compatibility and total reliability all in an easy-to-use printer!

NEW star NP-10 PRINTER

From MidWest Micro

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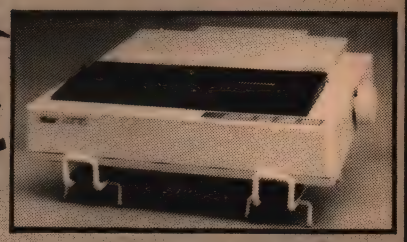

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Full Featured NP-10 Printer

- **Quality Printing with Star Reliability**
- **Both Fine Near-Letter-Quality and High Speed Draft Printing**
- **Ease of Operation with Front Panel Switches**
- **Friction and Tractor Paper Feed Standard**
- **Auto Paper Feed**

For ease-of-operation, dependability and unparalleled price performance, nothing beats the New Star NP-10. You get outstanding print quality at 100 cps in draft mode and 25 cps in near-letter-quality mode. The NP-10 is ideal for small business, educational and home use with its easy front panel operation. With the NP-10 you simply touch a button on the control panel to print in either draft or near-letter-quality modes. And it only takes a flip of the paper release lever to automatically feed single sheets into the Star NP-10. Unlike other printers at this price, the NP-10 comes with an adjustable tractor as well as friction feed. Other standard features include a clean, long-life ribbon cassette, forward and reverse microfeed and a nationwide service network. It all adds up to the Star NP-10 as a great printer choice.

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ND-15	649	CALL
NR-15	799	CALL
SD-10 (160 cps, NLQ, 80 Col.)	499	289
SD-15 (160 cps, NLQ, 132 Col.)	599	389
SR-10 (200 cps, NLQ, 80 Col.)	649	419
SR-15 (200 cps, NLQ, 132 Col.)	799	899
NB-15 (300 cps, 100 cps, NLQ.)	1349	899
NB24-15	1195	619
PowerType (18 cps Daisywheel	499	199
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Industry Supports continued from page 213

introduced in October of 1985 and, in addition to Ethernet, supports connectivity to a VAX via RS-232 serial lines, remote modem, and Corvus Omninet.

The pcLINK ethernet option supports DEC VAX systems running either VMS or Ultrix (via TCP/IP). A number of other UNIX based computer systems are also supported with the TCP/IP version. Any combination of VMS and TCP/IP systems can be supported on the same ethernet. With the new pcLINK configurations, the physical connection between the Apple Macintosh and the VAX is accomplished using either the Kinetics FastPath (AppleTalk to Ethernet bridge) or the Kinetics EtherSC (a direct SCSI to Ethernet connection for the Macintosh).

Pacer also announced that it intends to support the AppleTalk Filing Protocol Services, which will be incorporated into future versions of pcLINK. This development will ultimately provide the same functionality as a local Macintosh running the AppleShare File Server software, but on a much larger scale. The portion of the VAX file system to which the user has access can be viewed from the Macintosh as a series of HFS volumes with VAX directories being represented as folders and files as icons. VAX directories can be shared by many Macintosh users or designated as private. As an example of automatic file conversions that are provided, a VAX text file can be transparently accessed by either MacWrite or a VAX editor. Support for AFP has been implemented within normal VMS system security including login validation and file system protection. The new product will also enhance the ease-of-use of PacerPrint for the Macintosh user by making the LaserWriter (or other postscript printers) connected to a VAX selectable from the chooser menu.

For more information contact Pacer Software, Inc., 7911 Herschel Avenue, Suite 402, La Jolla, California 92037; (619) 454-0565.

PC MacBridge/AFP Links IBM PCs, Apple's New File Server

Tangent Technologies has announced PC MacBridge/-AFP, a software package that allows IBM PCs to access Apple's AppleShare file server. PC MacBridge/AFP is fully compatible with the published AppleTalk Filing Protocol (AFP), and allows PCs to be easily integrated into a networked server environment.

PC MacBridge/AFP works with PC MacBridge/ATB, an AppleTalk board for the IBM PC available from Tangent Technologies. The board enables the PC to function as a node on an AppleTalk network, allowing it to communicate with other networked PCs, Macintoshes and PostScript laser printers. Once the software is installed, the PC becomes a client of an AFP server, and can access both PC and Macintosh files. After logon, the PC user mounts a volume on the remote server and acceses its files as if they were internal to the PC.

Additionally, PC MacBridge/AFP and other software products from Tangent Technologies will work with Apple's AppleTalk PC Card and will work within the Apple Communication's Framework of integrating and enhancing MSDOS information.

"In the near future we expect to announce additional products that will further integrate the IBM PC into the AppleTalk network," explained Guy Mariande, vice president. "These products will enable companies to take advantage of the full-featured AppleTalk network without having to give up their installed base of PCs."

PC MacBridge/AFP is the latest part of an integrated family of products from Tangent Technologies that allow Macintoshes and IBM PCs to share information and peripherals within an AppleTalk network. Recent products include PSPrint, which maximizes the capabilities of PC-based programs like Word, Windows, PageMaker/PC and others to output PostScript files directly over AppleTalk to a networked laser printer.

PC MacBridge/AFP will be available in March 1987 for $150. PC MacBridge/ATB, which includes PSPrint, is available for $350. Tangent Technologies is the industry leader in bridging the gap between IBM and Apple technologies and has been shipping PC MacBridge products since May 1985.

For more information contact Tangent Technologies, 5720 Peachtree Parkway, Suite 100, Norcross, Georgia 30092; (404) 662-0366.

3Com To Support Apple's File Server Protocols

3Com Corporation announced it will support Apple's AppleTalk Filing Protocol (AFP) specification in its future Macintosh products.

"The functionality provided by AFP and Apple's new network-aware Finder program will establish a new standard in the Macintosh network marketplace," said Bob Bressler, 3Com vice president and general manager of the application software division. "3Com has always been committed to developing products that are compatible with industry standards, and will certainly ensure AFP compatibility in its future Macintosh products."

3Com currently supports MSDOS 3.1 and 3.2, the Microsoft Redirector, NetBIOS, Ethernet (IEEE 802.3) and Token Ring (IEEE 802.5) in the IBM network environment. 3Com's current Macintosh network products support the Macintosh Hierarchical File System, AppleTalk and PostScript print spooling. Future Macintosh products from 3Com will be compatible with AFP and the network Finder, and will support multiuser applications written to Apple's file system specifications.

For more information contact 3Com Corporation, 1365 Shorebird Way, Mountain View, CA 94043; (415) 961-9602. ●

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MacUniverse

by L.J. Kutten

A Scanner is Coming: The big news this month is that Apple is planning to market an optical scanner in order to strengthen its position in desktop publishing. This is a device that converts the images on a printed page into computer storable data. Look for a release sometime in the third quarter of 1987 with a price of approximately $3000. Apple will not manufacture it, but buy it from an OEM manufacturer (DEST is one of the names being bandied about) and slap its name on it.

Database rumor: Another hot rumor has Apple releasing a French developed, multi-user relational database for the Macintosh. Supposedly the coding is completed, but the program lacks (a) documentation and (b) the user interface must be translated into English. Being a multi-user system means Apple must have both a file server and a totally new operating system.

My gut reaction says this rumor is false. Apple's success (as well as every other hardware manufacturer's) is based on the constant availability of new and better software. If Apple starts competing with its own software developers, it runs the risk that they might quit Macintosh development to work on a system where the hardware manufacturer is not competing with them.

A New Dot Matrix Printer: Another rumor has Apple releasing a high resolution dot-matrix printer called the BusinessWriter. Sources say this printer will (a) incorporate the Postscript printer interface software, (b) cost $2000 and (c) print over 200 dots per inch resolution (the Laserwriter is 300). This rumor is probably true as Apple needs a high quality dot matrix printer to round out its product line. No matter how you define printer needs, there is still a market niche for a printer that can handle multiple copy forms.

Apple Contest: Apple recently announced a $50,000 contest for Academic Achievement Awards for Excellence. The contest is open to any member, staff, or student at any accredited two or four year college as well as any member of a noncommercial or nonprofit organization affiliated with the college.

The requirements are simple: the product must run on/work with an Apple product from the Apple II or Macintosh product family; it must be "shareable" in that it is available to others on a no-cost or at-cost basis; and the application must have been in active use for at least one quarter/semester before submission.

The categories for eligible entries include in-class instructions, teaching tools, study/research tools, development tools, and special achievements.

Each entry will be judged on whether it is a completed work; advances or demonstrates new uses of the technology in education; improves the learning and/or teaching process; is easy to use; aids in effective problem solving; is shareable; is an example or resource upon which others may build; and has been evaluated after use by the author. No prize over $5000 will be awarded for any one program.

Official entry forms are available from Apple: write Apple Computer, 20525 Mariani Ave., MS 23-E, Cupertino, CA 95014; Attn: Beth Ann Moore.

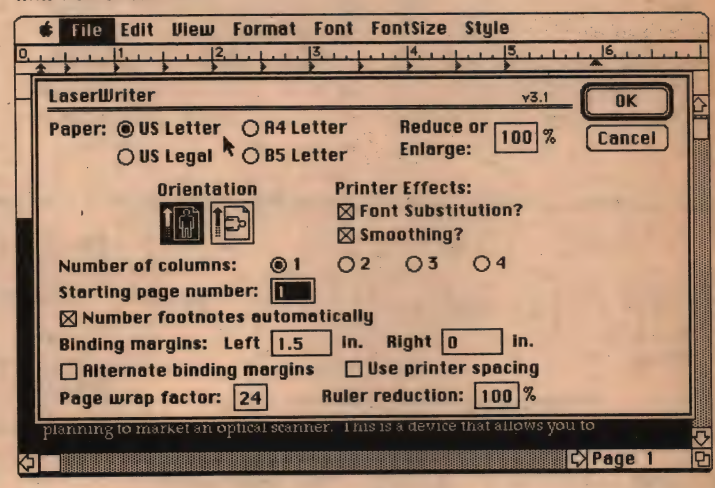
Still Another Apple Contest: For the elementary and high school students, Apple has announced Competition '87. This is the Fourth Annual Apple Computer Club Merit Competition. This year's competition features four categories: Community Service, BASIC Programming, Computers in the Curriculum, and Judge's Choice. Each category has three levels; kindergarten through fifth grade, sixth through eight grades, and ninth through twelfth grade.

Prizes for each level in each category include an all-expense paid trip to visit Washington, D.C., and an Apple II system for the school. Contestants can enter as many times as they wish so long as an offical entry form is used and it is postmarked on or before April, 15, 1987. Entry forms are available from Apple Computer Clubs International; 175 Middlesex Turnpike; Bedford, MA 01739; 800/343-1425.

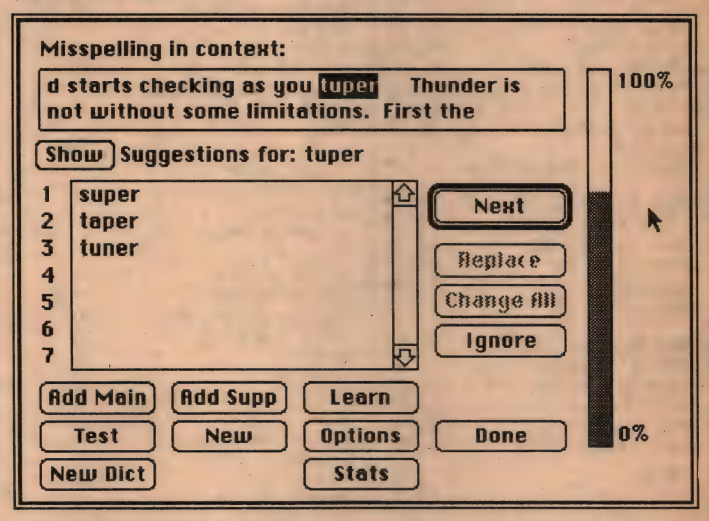
Sell your Apple stock: Normally stock hints and tips are not my style (the stock market and I have a deal, I put money in and the market keeps it), but I recently read that in late December, 1986, John Scully, Apple's C.E.O., and numerous other high Apple officers unloaded a large portion of their stock (Scully sold over 100,000 shares, 97% of his total holdings). According to the commentators, this was done for income tax reasons as 1986 was the last year long term capital gains was taxed at 20%; in 1987 is goes up to 28%. I do not buy this reasoning as the actual dollar

continued on page 218

Write Now Screen No. 1


File Edit View Format Font FontSize Style
LaserWriter v3.1
OK
Cancel
Paper: US Letter A4 Letter
US Legal B5 Letter
Reduce or Enlarge: 100 %
Orientation
Printer Effects:
Font Substitution?
Smoothing?
Number of columns: 1 2 3 4
Starting page number: 1
Number footnotes automatically
Binding margins: Left 1.5 in. Right 0 in.
Alternate binding margins
Use printer spacing
Page wrap factor: 24
Ruler reduction: 100 %
planning to market an optical scanner. This is a device that allows you to
Page 1

Thunder Screen No. 1



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amounts do not make sense. Assume Scully bought his stock at $20 and sold it at $40. In 1986 he will pay $4 per share capital gains tax and net $16 (($40-$20)—20% = $16). After January 1, 1987, the stock will only have to rise to $42.50 (($42.50-$20)—28% = $16.30) for Scully to be in the same after tax dollar position that he was in 1986. Now if Scully and the other Apple executives were bullish on Apple and expected the stock to go above $42.50 in the near future (it was $42 on December 22), why did they sell their stock? However if they are bearish on Apple and expect it to drop in the foreseeable future, their actions make perfect sense.

Books Redux: The good folks at Scott, Foresman and Company sent me two more books to look over. The first book is *The Complete Book of Macintosh Assembly Language Programming Volume II* by Dan Weston. At $22.95, this book ranks as a "must have" for every software hacker. It is over 400 pages and contains nine chapters, three appendices and an index. The text covers such topics as memory management, the differences between the old and new ROM, how to share data between programs using the Clipboard and Switcher, manipulating the print manager, dialog user items, making the Macintosh talk, RAM disks, and the list manager.

I do not have the same positive feelings about *The Complete Guide to Omnis 3* by Donna M. Mosich. But before you take my comments as the gospel truth, I have to state I approached this book with a negative attitude. One of my pet peeves with the computer book industry is that many books do nothing more than rephrase the instruction manual. Unfortunately, this book fits that criteria.

As the title implies, all *The Complete Guide to Omnis 3* does is explain how to use Omnis 3 and Omnis 3 Plus databases. Once you remove the material found in the Omnis 3 user manual, the book is nothing more than a series of examples on how to use the various commands. I feel it is too complex for the beginner yet at the same time, too simple for the advanced user. It's market niche, if it has one, is for the beginner who cannot understand the manual.

The book is well written and easy to read. It is 352 pages of extremely large type (about twice the size *Computer Shopper* uses) and contains sixteen chapters, five appendices, and an index. The text itself breaks into six sections: an introduction to databases; a complete tutorial; an introduction to power commands; still another tutorial; an overview of the power features of Omnis 3 Plus; and a series of appendices.

At $22.95 the book is not overpriced for what you get. I would recommend it to anyone who cannot understand the Omnis 3 manual. But if already an Omnis 3 power user it is probably not that useful.

A New Spell Checker from Batteries Included: This month brought Thunder from Batteries Included. This is an excellently designed interactive spelling checker that squeezes 50,000 root words into a mere 88K. Compared to its main competition (Spellswell, MacLightning, and Hayden Speller) Thunder is by far the most flexible. Among the programs it works with are MacWrite, Microsoft Word, MORE, Microsoft Excel, PageMaker, FactFinder, Edit, MockWrite, the Finder, Red Ryder, and Microphone. It does not work with FullPaint or Microsoft File.

Thunder is very simple to operate. Merely pull down the desk accessory menu and select it. The program loads the dictionary automatically and starts checking as you type. Every time you type a misspelled word the program beeps (a user option lets you set the menu bar flashing instead) flagging you. A quick keystroke and Thunder will provide you with its suggestions for replacement words. And if you are not sure about the spelling of a word, Thunder will test it out for you. Once you have found the correct spelling, another key stroke

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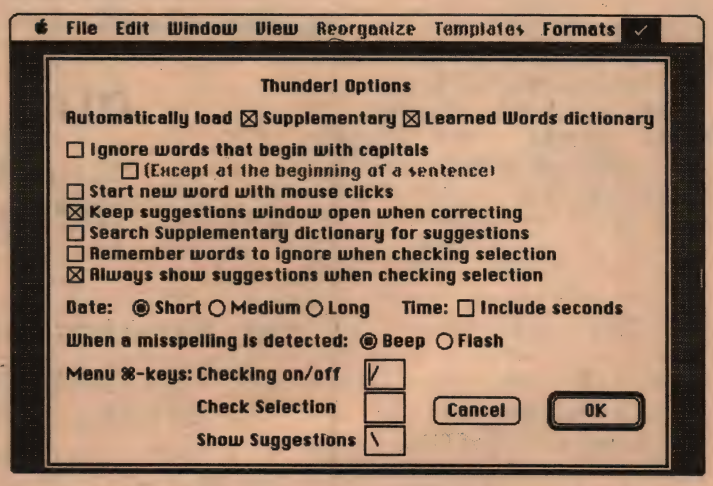
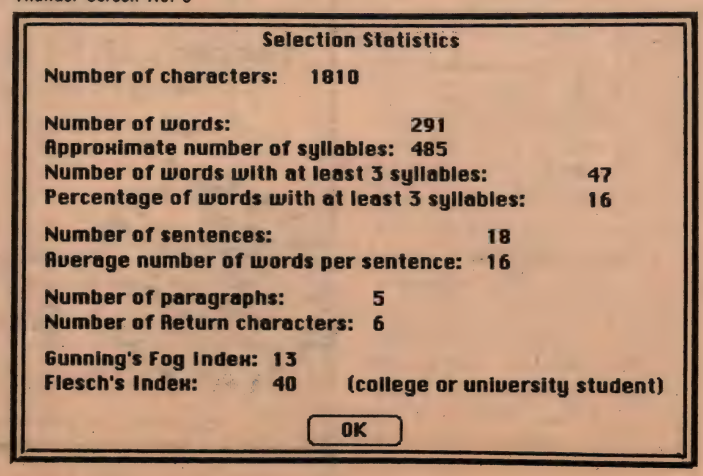

File Edit Window View Reorganize Templates Formats
Thunder! Options
Automatically load Supplementary Learned Words dictionary
Ignore words that begin with capitals
(Except at the beginning of a sentence)
Start new word with mouse clicks
Keep suggestions window open when correcting
Search Supplementary dictionary for suggestions
Remember words to ignore when checking selection
Always show suggestions when checking selection
Date: Short Medium Long Time: Include seconds
When a misspelling is detected: Beep Flash
Menu ⌘-keys: Checking on/off
Check Selection
Show Suggestions
Cancel
OK

Thunder Screen No. 3


Selection Statistics
Number of characters: 1810
Number of words: 291
Approximate number of syllables: 485
Number of words with at least 3 syllables: 47
Percentage of words with at least 3 syllables: 16
Number of sentences: 18
Average number of words per sentence: 16
Number of paragraphs: 5
Number of Return characters: 6
Gunning's Fog Index: 13
Flesch's Index: 40 (college or university student)
OK

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automatically inserts the correction.

Besides acting interactively, Thunder can spell check selections of text. I do not know the maximum file size but I was able to check a 100K file and unable to check a 300K file.

It is obvious that a lot of effort went into the design and testing of Thunder. The beta testing must have been fantastic, because try as I might, I could not crash it. You will also appreciate the fact that Thunder allows you to customize it. By pulling down the Option menu, you can change Thunder's behavior to meet your personal needs.

The manual is well thought out and easy to read. It is 74 pages and walks you through every operation of the program. There are even detailed instructions on how to get Thunder to work with a number of other programs.

Thunder has two extra bonus attractions. First it will analyze your documents and tell you (1) the number of characters, words, syllables, sentences and paragraphs, (2) the number and percentages of words with more than 3 syllables, and (3) the average number of words per sentence. Secondly it has a built in expansion capability. You can teach Thunder that certain letters or words stand for other letters or words. For example, you could tell Thunder that every time you type the letter "mac" to write Macintosh.

Thunder is not without some limitations. First, while the dictionary does not have any misspelled words that I could find, it is missing a large number of words that I feel should be in it (or any dictionary for that matter). These are primarily proper names such as Canada, France, and San Francisco, the various state names, and the like. Another limitation is Thunder's desire to split words for suggestions (e.g. "simplistic ally" as a replacement for "simplistically.")

All things considered Thunder is an excellent product and you cannot go wrong buying it. Whether you should buy depends upon your exact needs. From my perspective, Thunder's major competitor is MacLightning by Target Software. Thunder beats MacLightning in three critical areas; compatibility, price and size. There is no doubt in my mind that Thunder works with more programs than I use on a daily basis than MacLightning does. Secondly at $49.95, it is half the cost of MacLightning's. Finally, Thunder takes up half the space on a disk that MacLightning does (88K for Thunder versus 189K for MacLightning). Conversely, MacLightning does have one thing Thunder doesn't have: expansion modules. For an additional cost you can integrate Webster's Thesaurus, legal dictionary, and medical dictionary into the MacLightning dictionary. If you need them, they will outweigh Thunder's advantages.

A New Word Processor: The highest accolade I can give any program is that I went out and bought it. The reason for this is that sooner or later most Macintosh programs cross my desk. Over the years I have seen six spreadsheets, seven databases, four telecommunications programs, and innumerable desk accessories and games. So it is very rare that I get so excited about a program, that I go out and buy it knowing that within two months, I will probably get a free copy. Such a program is WriteNow by T/Maker. I first learned about WriteNow when perusing the GEnie Macintosh data files. At file number 3009 and 3010, I found a sample version of the program with one limitation. It printed a header and footer on every page saying it was printed with Sample WriteNow.

The reason I am so excited about WriteNow is that it is a writer's dream come true. It is a true WYSIWYG (What You See Is What You Get) word processor. It takes the ease and speed of MacWrite and adds the more powerful features of Microsoft Word. Among its features are (i) automatic and immediate repagination, (ii) visible page breaks (a la MacWrite), (iii) auto number-visible footnotes, (iv) adjustable on screen font sizes ranging from 4 to 127 points, (v) forward, backward, and wild card Find and Replace, (vi) superscripts and subscripts in point increments, (vii) date, time, and page number markers anywhere in a document, (viii) immediate printing of selected pages, and (ix) visible multiple columns (up to four) on the screen.

For me, the three most powerful features are the footnote tracking, the ruler, and printer spacing command. With footnotes, WriteNow places each at the bottom of the appropriate page. If a footnote is too long for the page it is on, it is automatically carried over to the next page. The ruler is unlike any you have ever seen. By holding down either the shift, command, or option key when using the ruler, you can make the changes either relative (all changes will be relative to the current setting for each paragraph), identical

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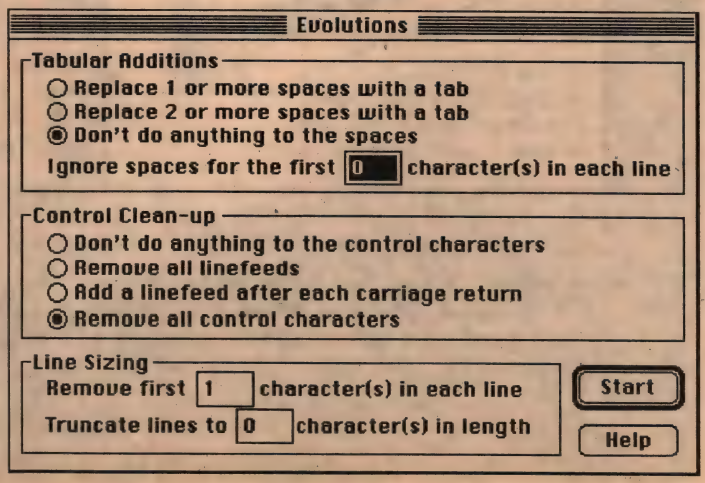
Thunder Screen No. 4


Evolutions
Tabular Additions
Replace 1 or more spaces with a tab
Replace 2 or more spaces with a tab
Don't do anything to the spaces
Ignore spaces for the first 0 character(s) in each line
Control Clean-up
Don't do anything to the control characters
Remove all linefeeds
Add a linefeed after each carriage return
Remove all control characters
Line Sizing
Remove first 1 character(s) in each line
Truncate lines to 0 character(s) in length
Start
Help

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Tempo: Macintosh Macros

by John J. Anderson

There is a small, select group of Macintosh programs that can be safely categorized as "indispensable." These are programs used on a daily basis by nearly every Macintosh owner in the world. The list is shrinking.

In the beginning, the programs MacWrite and MacPaint were in this category—now, however, with the advent of next-generation word processing and graphics programs for the Mac, that is not so true. Utilities such as Fontmover and Switcher remain necessities for the Macintosh power user, but the casual, everyday Mac owner need not trouble himself with these. Fact is, ask an individual Mac user what programs he considers indispensable, and nowadays you'll get answers as broadranging as the users themselves. Some will tell you Excel, others Jazz; some will tell you Crunch, others Click-on Worksheet; some will tell you more, others will tell you less.

About the only package I until late could think of, that still presents a good argument for inclusion on a list of indispensable software is Borland's Sidekick—especially the newest version, with its spreadsheet desk accessory. Certainly the only people getting along without Sidekick for the Mac are those who don't know about it or entirely lack a commitment to getting the most from their machines.

But after having spent a couple of days with Tempo from Affinity, which is itself a desk accessory of the most powerful nature, I have come to the realization that it is probably the most indispensable disk I have come across since I took my original system disk out of the Macintosh box.

What Tempo simply does is provide intelligent macro capability, a capability once sorely lacking, to any Macintosh with 512K or more. Have you ever wished the computer would do the formatting while you did the writing? Or looked for a simpler way to perform a complex search in a database? Or yearned to let the Mac log on to your electronic bulletin board system or mainframe while you're away? These are the kinds of functions Tempo can easily handle.

Tempo speeds simple tasks, like transposing two characters. It simplifies complex tasks, like saving information from an accounting program, moving it into a spreadsheet, performing a ratio analysis, and sending the results via modem to a remote location, all with a single command. And Tempo can automate everyday tasks, like opening a program along with your three most commonly used files, while putting them in the order you prefer. The program can speed, simplify, and automate your daily use of nearly any Macinotsh program. It frees you from the repetitive, routine tasks that computers perform so well, to let you accomplish the real work that needs to be done.

Tempo makes macros, and macros save time. A macro is simply any series of commands or keyboard entries which you record once in order to replay over and over again with a single keystroke or mouse click. What's more, Tempo lets you devise "intelligent" macros. Your macro can "read" text or data from the clipboard and "decide" what action to take based upon its reading. It can loop, repeating the action, create a dialog box to let you decide what to do next, or automatically branch to another macro of your choosing. And the macros you create can work between different applications, automatically moving from one to another.

An Installer application puts Tempo on your system disks, as a desk accessory that can be pulled down at your convenience. When you select it, a new menu selection header appears in all applications, with the cloverleaf insignia of the command key. It allows you to playback Tempo macros, record new ones, or configure Tempo to your own needs.

When creating a new macro, Tempo records keyboard entries and mouse clicks and drags. In normal record mode it records the point at which you press the mouse button and the point on the screen where you are when you release it. In "real time" record mode, which is a custom menu selection, Tempo will record all mouse movements, including any and all meanderings between the point at which you press the button and the point at which you release it. When you replay the macro, you will see the cursor following your actions on the screen exactly as recorded during the real time portion of the macro. This can be a very effective means of training new users of the Macintosh, and is reminiscent of the "Guided Tour" disks that once shipped with Mac system units.

After you have recorded a macro, you may then choose to save it. You will need to choose a name for your macro, and, if you like, a key-combination to automatically enact it. Then, whenever you are in the specific application to which it is attached, a quick tap on the assigned keycode will activate the macro. It's really that simple.

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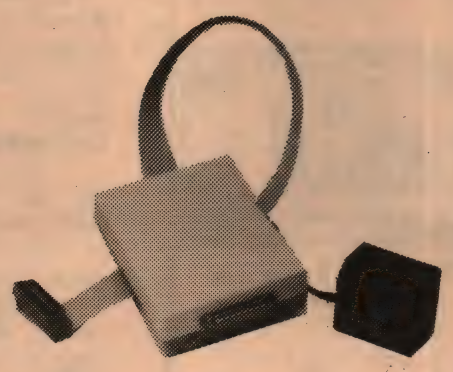

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(only paragraphs that have the same exact settings as all those in the first selected paragraph will change), or continuous (instead of using the ruler's fixed scale, setting can be made continuously on the ruler). The printer spacing command allows you to optimize character spacing on the Laserwriter. It uses the ROM in the Macintosh Plus and Enhanced to improve character spacing. In my mind, it improves a Laserwriter by 20 percent.

Along with WriteNow come two auxiliary programs: Translator and a dictionary. Translator is a stand-alone program that translates MacWrite, Word, and text documents into the WriteNow formats. It operates very fast and for the most part keeps a document format. It even converts headers, footers, and footnotes. The dictionary contains 50,000 words and is integrated into the program. Once started it begins at wherever the cursor is located and works forward through the document. Once a section of text has been checked it is marked internally as having been checked. If that section is later checked, it will not be checked unless you have edited the text since the last checking.

The dictionary is not interactive and works only in the batch mode. Third party interactive dictionaries, such as Thunder and MacLightning, do work in the interactive mode, but not the check selection mode.

WriteNow does have some limitations. The more prominent ones include (i) no mail merge, (ii) the cursor arrows on the Macintosh Plus keyboard are not implemented, (iii) no expansion capabilities (e.g. type the word "mac" and have "Macintosh" appear), (iv) no on-line help, (v) footnotes cannot go at the end of the document, and (vi) no small caps implemented for character formatting.

Another weak point is the manual, It is 174 pages and attempts to walk you through the program. While an experienced Macintosh user will have no trouble with it, it is unclear and difficult to read in some places.

WriteNow has a suggested retail of $175 and is available direct from T/Maker or your local software store. It is not copy protected and a sample version is available. If you need another word processor take a look at WriteNow.

Telecommunication Programs of the Month: It seems my comment in the January issue of *Computer Shopper* that I was starting to review programs not appearing in Compuserve's MAUG data libraries struck a raw nerve with MAUG's chief SYSOP Neil Shapiro. Now Neil is a great guy and I think the world of him but he is afraid that my statement about programs not showing up on MAUG might make it appear "to a new user of telecom...that MAUG is somehow on the way out." I want to put Neil's mind to rest; MAUG is not on the way out. But just remember Neil, GEnie as number two in Macintosh telecommunications services always has to try harder.

With this in mind, my telecommunication program of the month is only found on GEnie (sorry Neil). Called Evolution, it will convert series of spaces in a file into tabs (nice for converting a text file for use as a spreadsheet); do general clean-up work by removing control characters; and add or delete linefeeds (for IBM to Mac conversions and the reverse).

The program is very fast (about 5K/sec. on a Mac Plus) and it has on-line help and a control panel for setting user options. Evolution is shareware ($10) and if you decide to keep it, you are honor bound to pay the fee.

Products Mentioned in this Column

Dan Weston, *The Complete Book of Macintosh Assembly Language Programming Volume II*—suggested retail price $22.95. Donna M. Mosich, *The Complete Guide to Omnis 3*—suggested retail price $22.95. Scott, Foresman and Company, Professional Publishing Group, 1900 East Lake Avenue, Glenview, IL 60025.

Thunder—suggested retail price $49.95. Batteries Included, 30 Mural Street, Richmond Hill, Ont. Canada L4B 1B5. 1-800-881-9941.

WriteNow—suggested retail price $175.00. T/Maker Company, 1973 Landings Drive, Mountain View, CA 94043. 415/962-0195.

Academic Achievement Awards for Excellence. Apple Computer, MS 23-E, 20525 Mariani Ave., Cupertino, CA 95014. 408/996-1010.

Competition '87, Fourth Annual Apple Computer Club Merit Competition. Apple Computer Clubs International, 175 Middlesex Turnpike, Bedford, MA 01739. 800/343-1425.

Evolutions — Shareware fee $10. Located in GEnie's Macintosh database, file #3117. Kevin Hoctor, Emerald Computing Services, Inc., Suite 490, 2707 N. Loop West, Houston, TX 77008. 713/880-2705. ●

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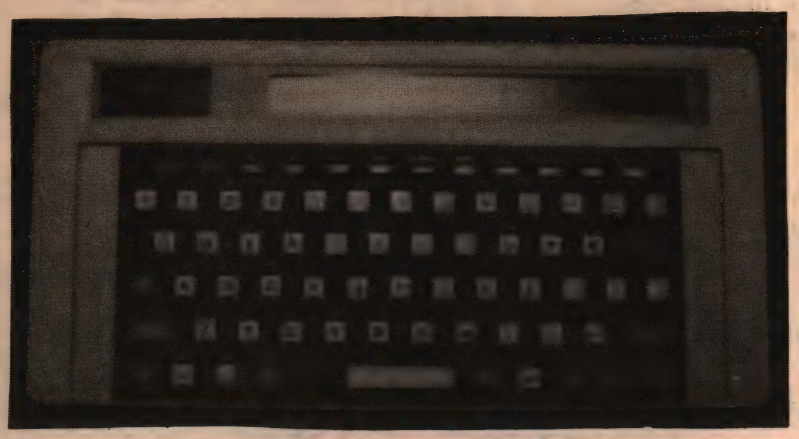

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If you choose "options" while recording a macro, you may choose between features designed to give Tempo macros their "intelligence." The specific options are pause, branch, loop, and open application.

Three types of pause are available: pause for user entry, pause for interval, and pause until. Pause for user entry will cause a macro to temporarily stop during play. It will wait while you enter information or provide instructions to a user, then resume when instructed. You may use this to enter text or data, make a database selection, or wait for a "connect" prompt. In default mode a dialog box pops up, allowing you to display information during the pause. The dialog box can be tailored to wait for a keypress, or go away automatically allowing the macro to resume. Alternatively, you can deselect the dialog box entirely. Pause for interval will make a macro pause during replay for the hours, minutes, or seconds you specify, after which the macro will resume. One use of pause

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for interval is to allow a program to catch up with the events you have recorded. For example, if your macro brings you from one application, through the Finder, to another, you may need to throw in a one-second pause in the Finder, so the events can sort themselves out and replay in the proper sequence. Pause until is the same as pause for interval, except that it waits until a given clock time before resuming. One use for pause until is unattended telecommunications, to take advantage of low night rates, or to improve your chances of logging on to a busy bulletin board.

Branch will either unconditionally branch to another macro, so you may connect macros together, or will compare the value you enter in a branch dialog box text window to something you have cut or copied into the clipboard, and base further action on that. Your macro may branch to another macro, perform those actions, then return to continue a sequence, or branch permanently to another macro. Or it may terminate itself entirely, based on comparison with the clipboard. Branching is a good way to make your macros modular. For example, you should always record the act of quitting an application and returning to the finder as one macro. Then record the opening of another application as a second macro. Finally, connect the two macros with a branch. That way, if you later need to edit the macro to include other commands, you won't need to start in the first program in order to edit commands that take place in the second program.

Looping is another feature. A loop is a sequence of commands that will repeat itself as often as needed. You may choose to loop through a series of commands a certain number of times (loop for), or loop until Tempo "sees" a particular text string or number in a cut or copy operation (loop until). You can also loop if Tempo reads a certain entry. For example, a looping operation can read down a spreadsheet, select any cells that are within a certain range, and make those cells into boldface, while skipping others. Or, you could record a simple command to find a text string in a word processor, change its size and font, and then loop until it's no longer found.

The open application option holds two major benefits for Macintosh users: with a single keystroke it will open any application from the Finder, even one that is deeply buried in multiple levels of folders. And, it avoids the problem of position-dependency. That is, since you're not simply clicking on an icon, your macro will replay correctly even if you later move your folders and icons around.

Selecting real time in the Tempo menu while recording a macro will immediately start recording all of your actions—and the amount of time they take—exactly as you perform them. If you move the mouse around the screen, your Tempo macro will replay those mouse movements. If you wait for five seconds before doing anything, Tempo will wait for five seconds. Real time recording is designed primarily for creating self-running demonstrations, where you want the user to see exactly what to do. But there are other important uses as well. Since in the normal mode the program records only where you press the mouse button and where you release it, the points in between will be lost on replay. By shifting into real time, your exact mouse actions will be remembered when you play the macro again. So, you'll find real time useful in graphics-oriented applications. You can also use real time as an alternative to pause for interval to make short delays in your macros.

Playback of a macro is enabled either by command code or directly from the Tempo menu header. You can interrupt a macro sequence by holding the mouse button down or by pressing command-comma. From the command menu you can play, edit, rename, delete, import, export, or list Tempo macros. Import means bringing a macro over from another system disk, export means sending a macro over from a current system disk. List creates a text file of macros and their associated keycodes, listed alphabetically. You may open the list using any word processor.

The configuration menu allows you to define what kinds of keycodes to call—command key codes, option keycodes, or both. It lets you specify a default drive (a must for hard disk owners). It also allows you to play back a macro at any speed, from full-speed (100 percent), to a slow 10 percent of normal speed. The feature is intended primarily for use during editing, when you need to pinpoint events. It is also useful for demonstration macros, although playing back at a slow speed is very different from playing back in real time. You are advised to experiment to see what speed makes the most sense for your needs.

You are able to edit existing macros. While you are editing a macro, another "parallel" macro is being created—one which incorporates your changes or corrections into the original. So, when you've finished editing a macro, you're given the chance to save the edited version as a separate macro, or replace the original macro with the edited version, or to simply discard the altered version and keep the original intact.

A utility called the Tempo Comparison Workbench is also included on the program disk. This utility helps you see if your conditional tests are accurate.

Another utility, Set Startup, is also included on the the program diskette. Set Startup is Tempo's "autoboot" command. You may assign a macro to this utility, and when you insert a disk and turn on the Mac that macro will then run automatically. You may also double-click on the icon to run the assigned macro.

Although my experience was that Tempo ran very smoothly in all environments, the documentation includes a section on tips and fixes, and an addendum sheet warns about various incompatibilities be-

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San Francisco MacWorld

by L. J. Kutten

The Winter 1987 MacWorld Exposition held in San Francisco January 8-10, was a resounding success. Taking over half the floor space of the Mascone Center, it was a virtual cornucopia of Macintosh information and products. As I wandered about the show floor and seminars for three days there was a feeling of excitement and electricity that I had not felt since the first heady days of the Macintosh back in 1984. Everywhere I looked I saw new and significant products. This show also represented a right of passage for the Macintosh: it passed from the level of game/consumer machine into a bona fide business computer capable of taking on the IBM PC in the byways and offices of corporate America. It would be impossible for me to describe everything, so what follows is only a brief sampling of what I saw and heard.

New Hardware

Disk Drives: This show represented the commoditization of SCSI disk drives. They have now become like refrigerators and other appliances. Try as I could, I could not tell that much difference between the various brands. The absolute cheapest hard disk I saw was made by Jasmine Computer Systems. On the floor, it was selling a 20meg drive for only $589 and taking orders for 80 meg drives at $1380 (the 80 meg unit is not vapor ware). Both units are compact (2" by 10" by 10"), have two switched AC outlets, and come packed full of the best public domain and shareware software. Jasmine is offering a 30 day money back guarantee and a one year replacement warranty.

Another interesting hard disk supplier was Rodime Systems. This company has been known for a long time as a quality O.E.M. manufacturer of hard disk. The subassemblies used in many of the other brands are made by it. It is now selling 20 and 45 meg, external and internal units, under its own name. The external units, the 20 Plus and the 45 Plus, are compact and designed to fit underneath the Macintosh. They have a suggested retail price of $1195 and $1595. The internal units, the 20I Plus and the 45I Plus, have been specifically designed to allow for quick heat dissipation. All Rodime drives come with the File Guard backup software and a one year limited warranty.

There were also a lot of 40 meg tape backup units being shown. Manufacturers included Mirror Technology, Kamerman Labs, SuperMac, Peak Systems, and others. Other than speed they operate identically to other hard drives. Their primary use is for making backups. They are not that fast (one meg per minute) and none were currently being shipped. Average cost will be around $1200.

File Servers: Besides the stand alone hard disks, there were a number of file servers being sold. A file server is a hard disk suitable for multi-user operation. The one I liked the best was the Keeper Plus File Server by Reach Technologies. Designed to work with up to 31 Macintoshes, this unit offers simultaneous access to the same file, multiple levels of security, and storage capabilities for over 2000 files. The Keeper is fast and transfers data at 230 Kb/sec. It is available in 20, 40, 80, or 120 megabyte fixed media. As an extra cost option, a 10 megabyte removable hard disk cartridge can be added. This unit is not cheap. A 20 megabyte system has a suggested retail price of $1795.

A Mouse Replacement: Video game enthusiasts should again take a look at the Arcade Adapter by Nuvo Lab. This is an adapter that allows Atari

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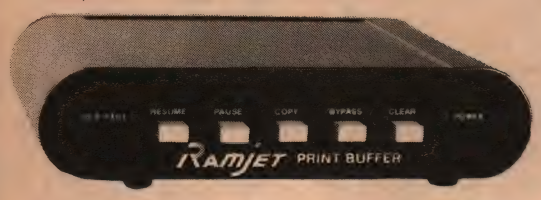

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The RAMJET Parallel/Serial version is a special design which allows connection of either a parallel computer to a serial printer or a serial computer to a parallel printer. The parallel port is a standard Centronics type connection which can be set for either input or output. The serial port is selectable for up to 19,200 baud and either DTR or XON/XOFF handshaking. The serial port has a set of four status lights which indicate its data and handshaking status.

With these different RAMJET versions to choose from, you can choose the RAMJET that fits your needs without spending extra money for unwanted features.

EXPANDABLE!

The RAMJET Print Buffer is expandable up to 512K of buffer memory. The RAMJET comes with your choice of 16K, 64K, 256K, or 512K of buffer memory installed and models with less memory installed can be upgraded to 256K just by plugging in larger memory chips. An optional card is user installable to expand to a full 512K memory! You can choose a RAMJET to fit your current needs and expand later as your printing tasks grow.

SPECIAL APPLICATIONS!

Useful features can be selected from a set of five buttons on the RAMJET front panel. COPY allows you to make multiple copies of the buffer memory. CLEAR clears the RAMJET memory of the current or past printing jobs. BYPASS allows you to temporarily halt printing from the buffer memory and print directly to the printer, bypassing the buffer memory. PAUSE selects pause mode for printing on single sheets of paper and RESUME restarts printing after the RAMJET has paused for a new piece of paper.

CUSTOM APPLICATIONS!

We can custom program the RAMJET for special applications such as PBX buffers or remote controllers, just contact Tim Stoner at (206) 624-4985.

RELIABLE!

The RAMJET Print Buffer is housed in a sturdy aluminum case for maximum protection and long life. The RAMJET has been designed, produced, and tested in the USA and it is covered by a limited 2 year warranty on parts and labor.

You can be confident that the RAMJET will continue to work for you flawlessly, and that we back up our products when you do need assistance.

RAMJET suggested list prices:

16K $169.00
64K $199.00
256K $269.00
512K $399.00
256K to 512k expansion card - $129.00

These prices are for the RAMJET Parallel/Parallel, Serial/Serial, and Parallel/Serial input/output versions. Be sure to specify which version you need. Add the RAMJET to your computer system today and save hours of wasted computer and operator time!

If you have any questions on whether the RAMJET will work for your application, feel free to call our Technical Support department. But don't delay, call us at (206) 624-4985 or see your local computer dealer now!

Omnitronix, Inc.
760 Harrison Street
Seattle, WA 98109
(206) 624-4985

The right solution to boost your computer productivity!

Tempo
continued from page 223

tween Tempo and specific application programs. For example, ReadySetGo is entirely incompatible with Tempo. Also, it is not advisable to use Tempo in combination with Switcher, which is truly unfortunate.

Tempo also locks you into a single system disk, which means your boot disk remains the selected system even when you run an application from another volume. This can cause some unique problems —among others, you may not be able to eject your hard disk start-up disk when doing so through Tempo. It would be very convenient if Tempo offered a special type of branch to move between default volumes.

Still, Tempo is one of a new generation of indispensable programs. Once you have worked with it for a while, you will genuinely wonder how you ever survived without it. If you do not have Tempo right now, do yourself a favor, and go out and buy it.

Tempo is not copy-protected. For more information contact Affinity Microsystems Ltd., 1050 Walnut St., Suite 425, Boulder, CO 80302. (303) 442-4840. ●

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San Francisco MacWorld continued from page 224

type joysticks to be attached to the Macintosh. It has a $29 suggested retail price and fits into the must have category for serious arcade game players.

KeySkins: This is a flexible, clear plastic overlay for your keyboard. It stays on your keyboard (it is easily removed) and protects it from dust, spills, staples, and anything else that could destroy your keyboard. As someone who has lost keyboards to the ubiquitous Pepsi meltdown (spilling soda on a keyboard) I bought one for each of my Macintoshes. At $25, it is cheap insurance for every Macintosh user.

Portable Macs: A number of vendors were showing (not selling) portable Macintoshes. These are Macintoshes that have been reconfigured to fit inside a brief case. The Colby Mac is a good example of this genre. It weighs under 16 pounds and is 14" by 9.5" by 18". Its specifications include a removable flat plasma display, a removable modular hard disk, a removable modular power supply that works with either household current or 12 volt D.C., and a removable keyboard. But if you really want to go hog wild, you can customize the Colby Mac to fit your specific needs. The options include a backlit LCD screen, built-in modem, standard VCR video output, a built-in 150 cps ink jet printer with full Imagewriter capabilities that only weighs 2.5 pounds, and a keyboard adaptor for the IBM PC. According to Colby Systems, the unit will go into production once it gets FCC certification. Look for a price of between $5000 and $7000.

Scanners, et al.: The show was full of scanners. While they all had different names, they looked identical. This leads me to believe that they are all manufactured by the same O.E.M. For my money, the best scanner is one not yet released, Microtek's MSF-300 flatbed scanner. Unlike most other scanners, this unit can digitize information from bound volumes up to 14 inches in length. According to the Microtek representative this unit should be released in March at approximately $3500.

Microtek was also talking about MacOCR, an Optical Character Recognition software package. In theory this allows you to feed a print page to a scanner and instead of having a paint document generated, get a text file. If it really works and can read a wide variety of type faces, this will be a godsend to anybody who has old lists, articles, and the like that they want to put on magnetic media.

Add-On Boards: Power hardware users with a limited budget should take a look at Prodigy Prime by Levco. This is a clip on board (so it won't void your warranty or Apple Care) that adds a 16Mhz 68020 CPU, 1 megabyte of RAM, 64K of Prom, an internal fan, and beefed up power supply to your Macintosh. According to Levco, this board will turn your Macintosh into a powerful workstation for high power uses such as desktop publishing, artificial intelligence, and the like. Manufactured by one of the most respected names in add-on boards, the Enhance has a suggested retail price of $1995.

If you have a Macintosh 512 or 512E, and want to upgrade to SCSI capabilities without paying Apple's outrageous price, check out the Enhance board by SuperMac Technology. This is a daughter board that clips onto the Mac's microprocessor. Not only does this provide a SCSI port, but the SuperMac board has been optimized to prevent video conflicts between the video display and RAM; in turn, this allows a Macintosh 512 or 512E to run 30% faster than the Macintosh Plus.

Software

As interesting as the hardware was, new software was where the action was. One piece of software was so "hot"

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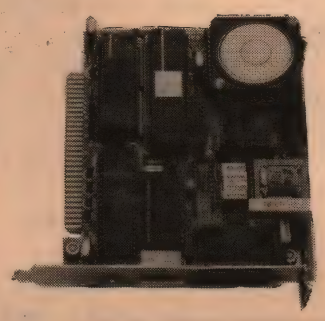

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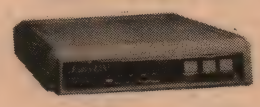

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that the San Francisco police vice squad came down and threatened to arrest one vendor. The product was MacPlaymate and succinctly, it is interactive erotica. The entire situation was resolved by the author demonstrating the program only to consenting adults who stepped inside the booth. As a side note, the same demo program was shown in Boston with nary a complaint from anyone.

Another vendor, LetraSet, was selling one page design program on the first day, and by the second day had dropped that product and bought another. In September, 1986, it purchased the distribution rights to MacPublisher II and other programs from Boston Software. The product was going to be renamed LetraPage and marketed during 1986. Well the product was not ready (fault depends on which side you talk to) and LetraSet bought the exclusive worldwide marketing rights to Ready, Set, Go!3. Needless to say, the folks at Boston Software are not that happy about the entire experience. They have gotten their marketing rights back and plan to have a new version of MacPublisher ready by March, 1987. This upgrade should cost less than $100.

As a side note, there were no new games shown. The closest I found was a brochure for a soon to be released jet flight simulator by Spectrum Holobyte. This game is far off as Spectrum was not even demonstrating it.

Japanese Writing: For the most visually beautiful artwork, you have to look at Japanese Clip Art and MacCalligraphy by Enzan-Hoshigumi Co., Ltd. The clip art comes in two volumes that cost $79.95 apiece. The first volume is entitled "Heaven" and contains 174 images and four fonts. The second volume is entitled "Earth" and has 193 images and four fonts. The art is entirely Japanese and can easily be modified using either MacPaint or FullPaint. MacCalligraphy is a writing program that simulates the medium of ink on paper. There are five shades of black ink and six brush sizes to choose from. Lines are drawn by dragging the mouse with the button held down. The thickness of the line can be varied at the speed at which the mouse is dragged. MacCalligraphy is expensive at $149.95, but it may very well revolutionize drawing on the Macintosh.

A Powerful Database: After dBase Mac got delayed by Ashton-Tate, I started looking around for a relational database that a PC dBase user could love. Well, I think I found one in McMax by Nantucket. At $295 it offers a dBase compatible programming language which allows a developer to create applications in either McMax or dBase which will run interchangeable on a Macintosh or an IBM PC. McMax is a relational database management system which can manipulate structure data from multiple files and produce customized reports. The system handles database files up to 63 megabytes and files up to 16 million records. Each database file can have seven active index files and as many as 100 index expressions. Ten separate database files can be opened simultaneously for merger of data from different files. Each record is stored sequentially with a fixed record length. Records can store up to 32 kilobytes and contain as many as 2000 fields of up to 254 alphanumeric characters or 63 decimal numbers each. McMax supports the Microsoft format thus allowing the transfer of data to Microsoft Word, File and Excel. McMax is scheduled for release no later than March 1987.

Data Encryption: If you need to encrypt your data, take a look at MacSafe by Kent Marsh Limited. This is a $39.95 desktop security system which protects your files from prying eyes. The program creates a safe where files are protected. The safe can only be opened if you know the correct password. Once inside the safe, the file can be encrypted by using either the American National Standard for Data Encryption (DES) or Kent Marsh's own QuickCrypt algorithm. MacSafe works on all Macintoshes and most hard drives. On a Macintosh Plus QuickCrypt will encrypt one kilobyte per five seconds. Using the DES standard it takes 24 seconds. Assuming it works safely (I have nightmares of a bug preventing the deencryption of a file) it will be useful to anyone using a network system.

Multi-user Appointment Book: Imagine Software was demonstrating its soon to be released Multi-User Appointment Diary with Smart Alarms. This is a scheduling and reminder system that lets everyone on an AppleTalk network to write to and/or view the schedule for everyone else in the office. It creates a shared calendar for up to 22 users on the menu at one time with additional groups of 22 added to any other available volume. It allows the custom design and automatic layout of calendar pages, supports standard Macintosh editing, and allows entry of 32K or text to each calendar day. Also included in the package is Smart Alarms. This is a desk accessory which automatically reminds you of things to do. Merely select the desk accessory, type up to three lines of text, and select the time and date you would like the reminder to appear. At the appropriate time, the reminder will come up on the screen on top of whatever application you are running. You can respond to it at once or simply send it away with the Return key and it will automatically return later. Reminders can be set for one time, or set to appear daily, weekly, monthly, quarterly, or even yearly. MultiAlarm has a suggested retail price of $149.95 and will be available by the end of the first quarter 1987.

Become A Poet: Frustrated poets will love the Personal Poet, a computer program that

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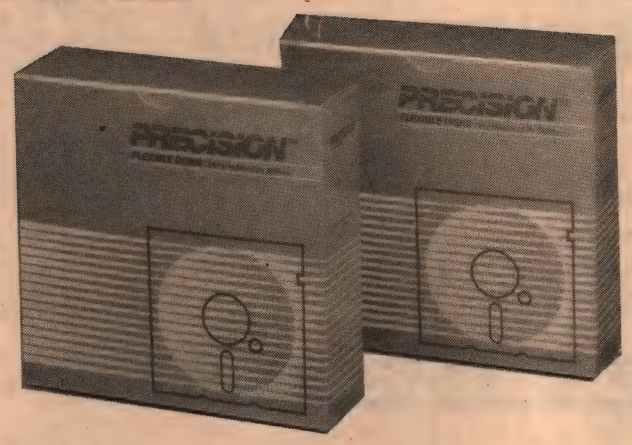

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San Francisco MacWorld continued from page 226

can turn anyone into a poet. In a short interchange with the program, you answer a few questions (e.g. to whom is it being sent, what is it about, the most descriptive trait, etc.), and the program then generates two poems for you to choose from (or start over if you want). Select the poem you want and it is printed out using a decorative font onto a special 5" by 7" greeting sized, form feed paper. Once you remove the backing from the paper, it fits into a card. While I am no judge of poetry, I did use the program twice and was extremely pleased with the poem it generated. And best of all the program is dirt cheap with a suggested retail price of $9.95.

Automated Book Typesetting: McCutcheon Graphics showed its $2000 automated book typesetting software, Page One. It eliminates the three major bottlenecks in book production: book design, typesetting, and proofreading of typset galleys. All that is required is (i) creation of the manuscript on a Macintosh using Microsoft Word and (ii) access or a Postscript compatible printer. Once the manuscript is in final form, you use Page One and select one of its 50 templates (representing standard book designs) from its catalog and enter its number on a simple screen form along with optional page format information. Supposedly, Page One opens up low cost book production to small book publishers who could not afford to do their own book production.

Products Mentioned In This Article

Software

Page One—Suggested Retail Price $2000
McCutcheon Graphics Inc.
Suite 101
130 Bridgeland Avenue
Toronto, Canada M6A 1Z4
416/789-2993

Your Personal Poet—Suggested Retail Price $9.95
Computer Poet Corporation
P.O. Box 7707
Incline Village, NV 89450
702/831-8800

Japanese Clip Art—Suggested Retail Price $79.95

MacCalligraphy—Suggested Retail Price $149.95

Qualitas Trading Co.
Suite 307
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Oakland, CA 94611
415/547-1520

MacPlaymate—Suggested Retail Price $49.95
Pegasus Productions
P.O. Box 912
Greenwich, CT 06836

McMax—Suggested Retail Price $295
Nantucket Corporation
Suite 300
12555 Jefferson Blvd.
Los Angeles, CA 90066
213/390-7781

MacSafe—Suggested Retail Price $39.95
Kent Marsh Limited, Inc.
Suite 210
1200 Post Oak Blvd.
Houston, TX 77056
800/325-3587

Hardware

Jasmine 20-Meg hard drive—Suggested Retail Price $589
Jasmine 80-Meg hard drive—Suggested Retail Price $1380
Jasmine Computer Systems
555 De Haro Street
San Francisco, CA 94107
415/621-4339

Lap Mac—Suggested Retail Price—Not Currently Set
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Fresno, CA 93705
209/222-4985

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Nuvo Labs.
225 Tank Farm Road
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805/544-5766

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Reach Technologies, Inc.
P.O. Box 9802
Austin, TX 78766
800/523-8392

Rodime 20 Plus—Suggested Retail Price $1195
Rodime 20I Plus—Suggested Retail Price $1295
Rodime 45 Plus—Suggested Retail Price $1595
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MSF-300—Suggested Retail Price—Not Currently Set

MacOCR—Suggested Retail Price—Nor Currently Set

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San Diego, CA 92121
619/457-2011

Enhance—Suggested Retail Price $149
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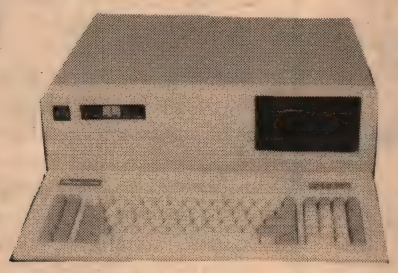

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New Version Of Borland's SideKick For Mac

A new version 2.0 of Borland's SideKick: The Desktop Organizer for the Macintosh includes Outlook, an outline processor; MacPlan, a spreadsheet desk accessory; and XMODEM file transfer communications protocol. SideKick version 2.0 is priced at $99.95 and will be available this spring.

As a full-featured outline processor, Outlook can be used as a desk accessory or application. Its resume feature provides the ability to open all documents from a previous work session. Any line in an outline can contain an entire text document or picture when using Outlook. Powerful text and block editing, the ability to hide and show detail, and page layout dialog features are part of Outlook's outline processing makeup. Outlook allows the user to simultaneously open and access as many outlines as memory can handle.

MacPlan combines spreadsheet and business graphics capabilities and operates as a desk accessory on top of other applications or on its own. The program is unique in its ability to do both scrolling and folding. With folding, the spreadsheet user can display, copy or graph selected rows and columns in a spreadsheet.

Support of XMODEM file transfer communications protocol has been added to the MacTerm accessory for easy file transfer. SideKick 2.0 contains all of the existing desk accessories such as the Notepad+, MacDialer, CalendarBook, Quicksheets, and the Calculator+.

SideKick 2.0 operates on Macintosh computers with 512K of memory. All registered owners of SideKick or ClickOn Worksheet (formerly from T/Maker Company) can purchase the update direct from Borland for $34.95. Those who purchased SideKick after December 1, 1986 can upgrade through Borland for $10.00 to cover shipping and handling fees.

For more information, contact Borland International, Inc. 4585 Scotts Valley Drive, Scotts Valley, CA 95066; 408-438-8400.

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MacInTax 1986: Income Tax Program For The Macintosh

SoftView has released the 1986 version of MacInTax, the popular income tax program for the Macintosh. This release is very early this year which is enormously helpful for the thousands of existing and new MacInTax users, in addition to the Dealers and Distributors who carry our products. This 1986 version has the major new capability of *interfacing directly* with virtually all spreadsheets, databases, and many accounting programs. MacInTax 1986 is able to read in any text file stored on any disk via an "Import" menu option. Once imported, the text file will appear in a window in MacInTax. Users can scroll the text window, click on any line containing an amount, then click on any line on the displayed IRS form or worksheet in MacInTax, and the selected amount will be automatically transferred to that line on the MacInTax form. Once transferred, MacInTax will compute and print with it identically to any other entered amount.

This interfacing capability is an enormous aid to people who have used spreadsheets, databases, or accounting packages (with text file exporting capabilities) to store their tax-related data. This data can now be accessed directly while inside MacInTax, and moved over with a simple "click-click" operation. In addition, a special "Exporter" application will be included on the MacInTax disk to allow users of the popular "Dollars and Sense" accounting package to also interface directly with MacInTax, via a text file.

SoftView has twenty-four of the 1986 IRS forms and schedules installed in this year's version of MacInTax, which includes the new 1986 tax tables. In addition, the complete IRS instructions are included (on disk). These instructions can be accessed at any time by pointing to the appropriate line and clicking twice, this is just like having the entire IRS book only a "click" away.

MacInTax is the top-rated income tax program for the Macintosh, with the unique capability of displaying the exact IRS forms on the screen in full graphic detail, and printing the entire IRS forms and all data onto blank sheets of paper, using either the *ImageWriter or LaserWriter* printer. These printouts have beenformally approved by the IRS for signature and submission, including the Form 1040.

MacInTax 1986 Federal contains 24 forms, and lists for $99. MacInTax 1986 California contains approximately 15 forms and lists for $45. MacInTax operates on *all* Macintoshes and is not copy-protected.

For more information contact SoftView, 4820 Adohr Lane, Suite F, Camarillo, CA 93010; (805) 388-2626.

Mention that you read about it in *Computer Shopper*. ●

Maconvert—Mac Graphics To Amiga

by H.W. Labadie

Converting Macintosh Graphics For Display On Any Computer With Special Emphasis On The Amiga

The establishment of the Macintosh as the standard computer graphics medium has led to the rapid accumulation of libraries of both public domain and commercially copyrighted high-quality black and white illustrations, whose subjects represent every category of pictorial interest and need. As these libraries accrete, so, too, increases the importance of the machine upon which they can be displayed and manipulated. Currently, the Macintosh is, despite the encroachments of Atari, Commodore, and IBM, the computer for the graphic artist. Yet, however singular may be the machine, it is not a product of a special creation: it is part of the microcomputer mainstream, and its qualities are not unique. It is possible to transfer the bit-mapped images for which the Mac is renowned to practically any computer which uses some sort of pixel-addressed graphic mapping and for which a version of BASIC is available, in short, practically any computer.

It is self-evident that the results will vary, depending upon the graphic's resolution and the power of the computer to which the images are to be translated, but if one does not own or have the use of a Macintosh, making use of it's products is the next best thing. In some cases, as will be seen, it can be even better.

For the purposes of this article, I will be dealing with two machines: the Mac and it's most powerful competitor, the Amiga. The simple fact is that, while thousands of digitized images exist in the ubiquitous MacPaint format, very few similar images are to be found in the various Amiga file formats. The strength and appeal of the Amiga resides in its superb color graphics, but, if it must go through the same long process of compiling its own libraries of pictures as has the Mac, then the Amiga must linger long in the Mac's shadow. Yet, that is not necessary.

As was said at the beginning, the Macintosh is part of the micro-mainstream, as is the Amiga, and they are, at bottom, more like than unlike. The striking graphics of the Mac can be shown on the Amiga, with even better resolution, and colored besides. There is no picture which, having been saved as a MacPaint file, cannot be converted into an IFF compatible, and therefore Amiga compatible, file. And, with patience, any of the images available to the Macintosh user can be viewed on any computer with bit-level graphics capabilities.

The reason for this lies in the simple and elegant MacPaint file format itself. The actual bit-image that is seen on the Macintosh's 512x342 monochrome display is composed of digital information in the computer's memory, with a digital one representing a black pixel and a digital zero a white pixel. Since the Mac's 9 inch screen is conceived as a window looking into a wider and longer page, the full size of which is 8x10 inches, and since, each inch contains 72 pixels, there are 576x720, or 414,720, pixels in every MacPaint document. With one digital bit used to hold the information for one pixel, one byte covers eight pixels, and 51,840 bytes are necessary to cover an entire page. But MacPaint documents seldom exceed 30K in size, and most fall into the 10K range, even if they fill a full page. It is the shorthand method of encoding those 414,720 bits of data that is responsible for the relative compactness of MacPaint files and for the fact that those files are readily accessible to the Amiga.

The typical MacPaint file is composed of 720 lines of 576 dots, encoded to as few as two bytes per line. This is how that economy is achieved. One byte is designated as a Counter Byte; if it is greater than 128 decimal, then it is a Repeating Counter; if less than or equal to, it is a Mixed Counter. The Repeating Counter tells the computer that the byte immediately following is to be written to the screen, and then repeated until the count is exhausted. Thus, as many as 1016 bits can be compressed into just 16 bits of computer storage, though, in practice, MacPaint will begin a new record whenever a scanline has been filled. The Mixed Counter tells the computer that each successive byte is to be read from the file and written to the screen until the count is exhausted. This consumes one more byte than the actual digital image itself, but the savings won by the repeating data more than compensates for that extra byte. From this, it must be apparent that it is a simple matter, indeed, to read and understand the information in a MacPaint document, and to manipulate it in such a way that any computer can form an approximation of the original Macintosh graphic. On the Amiga, this is especially easy, as the IFF format which DeluxePaint has made popular, is, for all intents and purposes, identical to that used by MacPaint. Therefore, with just some careful arithmetic, one can fool the Amiga into thinking that the file it is reading is native to it.

Listing 1 (page 232) is of a program in MicroSoft BASIC which will decode any MacPaint file and display it on the Amiga's monitor. This program will run on any computer which allows pixel addressing. It is slow, taking, on the average, three-quarters of an hour to fill the 400 lines of the Amiga hi-res display. But, once the image has been written to the screen, it can be saved using one of the many screen capture programs which can be found in the public and com-

continued on page 232

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DiskTop Utilities For Mac

CE Software has introduced DiskTop, a package of utilities designed to give the user more control over his or her Macintosh.

The centerpiece of the package is the DiskTop desk accessory itself. DiskTop allows you find, list, delete, rename, copy, move, or set attributes of the files on any disk without leaving the current application. Most commands support the selection of multiple files. The list of files can be sorted by name, size, date modified, type, or creator. Additionally, DiskTop can be used to create new folders, set default folders, and more.

DiskTop uses a graphic interface very similar to the standard Macintosh desktop, so even novice users will find the accessory easy to use.

Also included in the package is the LaserStatus desk accessory. LaserStatus continually displays the condition of the currently selected LaserWriter, showing who if anyone is using it. This allows people sharing a LaserWriter to determine whether it is busy before printing is started rather than after.

The Widgets application program is also included on the disk as a free bonus. Widgets is a grab-bag full of useful utilities, including commands for creating custom paper sizes for the ImageWriter, creating startup screens, converting PICT files to paint files, and sending PostScript programs to the LaserWriter. It also has the unique capability of printing small, sharp Thumbnail catalogs of paint files on the LaserWriter. These catalogues should prove invaluable to anyone with large collections of pre-drawn artwork.

A comprehensive manual is included.

DiskTop is available through selected dealers nationwide or direct from CE Software. Suggested retail price is $25.

DiskTop requires a Macintosh 512 enhanced or a Macintosh Plus. Recommended printers include the ImageWriter I and II and LaserWriter. The program is not copy protected and easily installs on hard disks.

For more information contact CE Software, 801 73rd St., Des Moines, Iowa 50312. ●

New Omnis Version From Blyth Software

Omnis 3 Plus, a faster and more powerful version of Omnis, the top selling multi-user database management program for the Macintosh, was announced recently. Omnis 3 Plus accesses a random record out of 100,000 in .17 seconds. This new version of Omnis provides data files as large as 160 Mbytes. As many as 64 users can simultaneously access more than 1400 fields with full record locking and password protection features. Omnis 3 Plus maintains forward compatibility so that any existing Omnis application can run without modification using Omnis 3 Plus.

One of the most important enhancements is a new manual to accompany Omnis 3 Plus. The documentation, which has been tested with end users, dealers and novice database designers, now includes an extensive tutorial to help first time database users learn Omnis 3 Plus. This tutorial section assumes no prior knowledge of databases, programming or Omnis 3, and leads the inexperienced user through the development of a multi-file database from scratch. For more advanced users, there is a new "Theory of Operations" section in the Reference manual to thoroughly explain advanced Omnis concepts.

Many new features have been added to Omnis 3 Plus such as time fields with time arithmatic, multi-line linked text fields with word wrap, and the ability to create scroll boxes. With Omnis 3 Plus, there is no limit to the number of formats of the same type in a library. There is an enhanced use of fonts for printouts. The font and font size can now be specified for each line of a report.

One of the more than 60 new macro commands gives database designers the ability to control the input and output to each field on the screen individually. The button margin is now removable for wider screens. The array is larger and there are more temporary string variables. Omnis 3 Plus provides memory based sorts which perform as fast as memory based products. The program automatically chooses the most efficient algorithm for sorting.

Additional import and export formats are provided and the ability to import and export data from within an Omnis application is now available. Omnis 3 Plus can start up any other Mac program through Omnis macros without having to go through the desktop. This allows satellite programs to be incorporated into an application.

Omnis 3 Plus' recommended retail price is $495. Blyth's upgrade policy extends to registered users of Omnis 3. The Omnis 3 Plus upgrade includes a new Omnis 3 Plus Tutorial, an Omnis Reference Manual, an Omnis 3 Plus Program Disk and an Omnis 3 Plus Utilities Disk.

For additional information contact Blyth Software Inc., 2929 Campus Drive, Suite 425, San Mateo, California 94403; (415) 571-0222. ●

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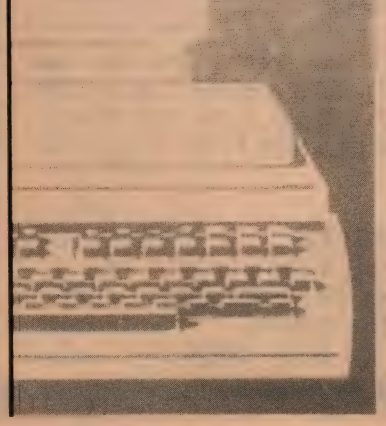

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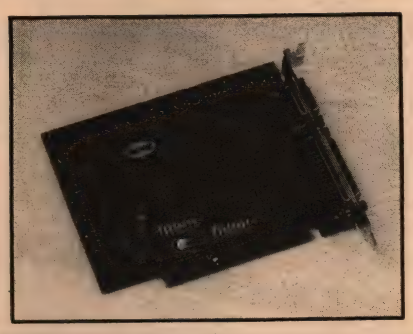

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Maconvert
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mercial sectors. Because all MacPaint files begin with a 512 byte header, (Illustration 1) containing information relating to special patterns used in the drawing and other reserved dataspace, the drawing itself is not read from the file until the 513th byte is reached. (Illustration 2, F900 hex.) The file is read one byte at a time, and data bytes are converted into a binary string of ASCII zeroes and ones, which are then concatenated into scanlines of 72 bytes each. When a string has reached the proper length, it is drawn to the screen. This is a generic solution to breaking the stranglehold which the Mac has placed on access to high quality illustrations. For the Amiga user, however, there is a specific remedy in Listing 2.

Listing 2 is for another BASIC program which, again, can run on any machine, but which converts MacPaint files into IFF files capable of being opened from a hi-res folder by DeluxePaint. Unlike the MacPaint file, the IFF file is begun with a variable length header, (Illustration 3) which, again unlike its MacPaint counterpart, contains essential information about the file, lacking which it is unrecognizable by DeluxePaint. Therefore, the first task of the program is to create a file header for the new IFF document by reading the data items at the end of the listing and writing them to the file, thereby establishing that the drawing will be of the single-bit-place (mono-chrome), hi-res type. The file can then be loaded from any of DeluxePaint's hi-res modes. Additionally, the program is designed to pad the MacPaint file being converted, filling out each scanline to the width of the Amiga screen, which can show all of the 576 pixels of a MacPaint document, plus 64 more. Thus eight bytes of repeating data, (F9FF hex), are added to the end of each Macintosh scanline, producing 80 bytes per line rather than the original 72, and eliminating the skewing of the drawing which would have occurred as the data from each following line wrapped up into the previous line. Also, there is some end-of-file filling which ensures that the file ends with a full cluster of records, so that, during transmission to the Amiga, no extra bytes will be added on reception. It is a peculiarlity of the Amiga to place the end-of-file pointer at the end of a cluster, rather than at the logical end of data. This peculiarity would annul the byte count encoded in the file, a count that must match the actual file length if it is to be used by DeluxePaint.

This program, by some quirk, runs between four and five times faster on the Macintosh than on the Amiga. Given that both languages are nearly identical versions of MicroSoft BASIC, that both programs are virtually identical, and that both machines are built upon the MC68000 processor, this extreme difference in computational times can only be blamed on the Amiga's rather schizoid operating system. If one is reduced to running this program on the Amiga, be prepared to go do something else for nearly an hour. On the Mac, the conversion is complete in under ten minutes on average. In Apple's own Macintosh BASIC, (Listing 3) the program runs even faster, finishing about 10% sooner than its MicroSoft equivalent, probably due to the initial compilation which MacBASIC performs before executing any instructions.

[The final IFF file, is ready to be opened by DeluxePaint. The 7th and 8th bytes contain the file size minus eight bytes, while the 125th and 126th bytes contain the file size minus the header length. These figures must be correct, or the file will not be loaded by DeluxePaint. The actual drawing data begins with byte 127.]

It should be noted here, that when the file is opened by DeluxePaint, the picture will be inverted, black to white. As this can be changed with three clocks of the Amiga's mouse, it did not seem worth the trouble to have the program make the change. The actual display of the converted drawing will then be very close to that of the original, but will be slightly elongated on the vertical axis. (Illustration 4.) This is a result of the difference in pixel aspect ratios between the two machines: the aspect ratio of the Amiga monitor is approximately 1.12:1 or .89, not the precise 1:1 of the Macintosh. This produces a Parmigiano-like distortion of drawings transferred from the Mac: while it is more noticeable on some subjects, such as the human figure, than on others, it is never offensive.

With the new version of DeluxePaint, it will be possible to create pictures larger than the screen, just as in MacPaint, and to convert full page MacPaint documents for use by DeluxePaint, simply alter the line reading "IF SCANLINE > 400 THEN..." to "IF SCANLINE > 720 THEN..."

Lastly, if the program is to be run on a Macintosh and the resulting file sent to the Amiga, be careful which terminal program is used on the Macintosh, as some emulators (*Freeterm* among them) will append those unwanted extra zeroes to the end of the file, rendering it unusable. MacTerminal works well for the transfer. The final *caveat* is the *pro forma* one, by which the author disclaims any responsibility for the results of the use of these programs. ●

LISTING 1

```
1 REM "MACSHOW - DISPLAY MACPAINT PIX ON ANY BIT-MAPPED COMPUTER. COPYRIGHT HORACE W.
LABADIE, JR. 1987"
5 CLS:INPUT"WHICH MACPAINT FILE TO DISPLAY";PICNAME$
10 CLS:OPEN PICNAME$ AS #1 LEN =1
20 FIELD #1, 1 AS BYTE$
30 A = LOF(1):SCANLINE = 1:BYTECNT = 0:LN$ = "":VX = 0:BI = 16:BO = 2
50 FOR I = 513 TO A:REM **** MAIN PROGRAM LOOP ****
60      GET #1, I
70      BYTE = ASC(BYTE$)
80      IF BYTE > 128 THEN GOSUB 500 ELSE GOSUB 700:REM *MIXED OR REPEATING?*
85      IF SCANLINE > 400 THEN 100:REM ** SCREEN LENGTH EXCEEDED? **
90 NEXT I
100 END
500 COUNT = 256 - (BYTE-1):REM ** REPEATING DATA LOOP **
510 I = I + 1:GET #1, I
520 BITPAT = ASC(BYTE$)
530 GOSUB 1000:REM ** CHANGE DECIMAL VALUE TO BINARY STRING **
540 LN$ = LN$ + NO$:REM ** CONCATENATE BINARY SCANLINE BITS **
541 BYTECNT = BYTECNT + 1
545 IF BYTECNT = 72 THEN GOSUB 1500:REM ** FULL LINE? **
550 COUNT = COUNT - 1
560 IF COUNT = 0 THEN GOTO 570 ELSE GOTO 540:REM ** ALL BYTES ADDED? **
570 RETURN
700 COUNT = BYTE + 1:I = I + 1:REM ** MIXED DATA LOOP **
710   GET #1, I:BITPAT = ASC(BYTE$)
720     GOSUB 1000
730      LN$ = LN$ + NO$:BYTECNT = BYTECNT + 1
740      IF BYTECNT = 72 THEN GOSUB 1500
750      COUNT = COUNT - 1
760    IF COUNT = 0 THEN GOTO 780
770  I = I + 1:GOTO 710
780  RETURN
1000  NI$ = HEX$(BITPAT):L = LEN(NI$):REM **DECIMAL TO BINARY SUBROUTINE **
1010  IF NI$ = "0" THEN 1240
1020  DEC = 0:PWR = 0
1030    FOR J = L TO 1 STEP -1
1040      K = ASC(MID$(NI$,J,1))
1050      IF K > 64 THEN K = K - 7
1060      K = K - 48
1070      IF K < BI AND K > -1 THEN 1110
1080      PRINT "Invalid Input"
1090      PRINT
1100      RETURN
1110      DEC = DEC + INT(K * BI^PWR + .5)
1120      PWR = PWR + 1
1130    NEXT
1140  H$ = "0123456789ABCDEF"
1150  NO$ = ""
1160  PWR = INT(LOG(DEC)/LOG(BO) + .0001)
1170    FOR J = PWR TO 0 STEP-1
1180      XX = INT(BO^J + .5)
1190      CH = INT(DEC/XX)
1200      NO$ = NO$ + MID$(H$,CH + 1,1)
1210      DEC = INT(DEC - CH * XX + .5)
1220    NEXT J
1225 IF LEN(NO$) < 8 THEN GOSUB 1600
1230  RETURN
1240  NO$="00000000":RETURN
1500 REM ** PRINT TO SCREEN **
1510 FOR P = 0 TO 575
1520     BIT$ = MID$(LN$,P+1,1)
1530     IF BIT$ = "0" THEN COLOR = 30 ELSE COLOR = 31:REM ** BLACK ON WHITE **
1540     PSET(P,VX),COLOR
1545 NEXT P
1550 LN$ = "":SCANLINE = SCANLINE + 1:BYTECNT = 0:VX = VX + 1
1560 RETURN
1600 ADDO = 8 - LEN(NO$)
1610 FOR Z = 1 TO ADDO
1620     NO$ = "0" + NO$
1630 NEXT Z
1640 RETURN
```

LISTING 2

```
1 REM "MACONVERT - CHANGE MACPAINT FILE TO IFF. COPYRIGHT HORACE W. LABADIE, JR. 1987"
5 CLS:INPUT"WHICH MACPAINT FILE TO CONVERT";PICNAME$
10 CLS:OPEN PICNAME$ AS #1 LEN = 1
20 FIELD #1, 1 AS INBYTE$:PNTNAME$ = PICNAME$ + "CNVT"
30 A = LOF(1):SCANLINE = 0:BYTECNT = 0
40 OPEN PNTNAME$ AS #2 LEN = 1
50 FIELD #2, 1 AS OUTBYTE$:GOSUB 2700:REM ** MAIN LOOP **
60    FOR I = 513 TO A:REM ** SKIP FILE HEADER **
70       GET #1, I
80       BYTE = ASC(INBYTE$):GOSUB 2000
90       IF BYTE > 128 THEN GOSUB 500 ELSE GOSUB 700
100      IF SCANLINE > 400 THEN 2500
110   NEXT I
120 END
500 COUNT = 256 - (BYTE - 1):REM ** REPEATING DATA LOOP **
510   I = I + 1:GET #1, I
520   GOSUB 2000
530   BYTECNT = BYTECNT + COUNT
540   IF BYTECNT = 72 THEN GOSUB 1500:REM ** FULL LINE? **
570 RETURN
700 COUNT = BYTE + 1:REM ** MIXED DATA LOOP **
710   FOR MXCT = (I + 1) TO (I + COUNT)
720      GET #1, MXCT
730      GOSUB 2000
740   NEXT MXCT
750   BYTECNT =  BYTECNT + COUNT:I = I + COUNT
760   IF BYTECNT = 72 THEN GOSUB 1500
770 RETURN
1500 LSET OUTBYTE$ = CHR$(249):GOSUB 2010:REM ** LINE PADDED TO 640 BITS **
1510  LSET OUTBYTE$ = CHR$(255):GOSUB 2010
1520  BYTECNT = 0:SCANLINE = SCANLINE + 1
1530 CALL MOVETO(10,10):PRINT "SCANLINE = ";SCANLINE:RETURN
2000 LSET OUTBYTE$ = INBYTE$:REM ** WRITE BYTES TO NEWFILE **
2010  PUT #2, J
2020  J = J + 1
2030 RETURN
2500 A = LOF(2):A1 = A:REM ** PREPARE TO WRITE FILE LENGTH DATA TO NEWFILE **
2510 IF (A1/256 - INT(A1/256)) <> 0 THEN GOSUB 2600:REM * FULL FILE SECTOR? *
2520 A2 = A1 - 8:LSET OUTBYTE$ = MKI$(A2):J = 7:PUT #2, J:J = 125:A3 = A1 - 126
2530 LSET OUTBYTE$ = MKI$(A3):PUT #2, J:CLOSE #2:CLOSE #1
2540 END
2600 DIF = A - (INT(A/256) * 256):A1 = A + (256 - DIF):LSET OUTBYTE$ = MKI$(0):FOR Z
= J TO A1:PUT #2, Z:NEXT Z:REM ** WRITE zeroes TO FILL FILE **
2610 RETURN
2620 END
2700 FOR J = 1 TO 126:REM ** CREATE NEWFILE HEADER FOR IFF FORMAT **
2710  READ OUTBYTE:LSET OUTBYTE$ = CHR$(OUTBYTE)
2720  PUT #2, J
2730 NEXT J
2740 RETURN
2750 DATA 70,79,82,77,0,0,3,150,73,76,66,77,66,77,72,68,0,0,0,20,2,128,1,144,0,0,0,0,
1,2,1,0,0,1
2760 DATA 20,11,2,128,1,144,67,77,65,80,0,0,0,6,0,0,0,240,240,240,67,82,78,71,0,0,0,
8,0,0,0,0
2770 DATA 0,1,20,31,67,82,78,71,0,0,0,8,0,0,10,170,0,1,3,7,67,82,78,71,0,0,0,8,0,0,
10,170
2780 DATA 0,1,0,0,67,82,78,71,0,0,0,8,0,0,10,170,0,1,0,0,66,79,68,89,0,0,3,32
```

continued on page 233

Maconvert

LISTING 3

```
REM "MACONVERT - CHANGE MACPAINT FILE TO IFF - MACBASIC VERSION 1.02. COPYRIGHT
HORACE W. LABADIE, JR. 1987"
CLEARWINDOW
INPUT"WHICH MACPAINT DOCUMENT DO YOU WISH TO CONVERT?";PNTNAME$
OPEN #1:PNTNAME$,INPUT,BINY,RECSIZE 1
ASK EOF #1,A
SCANLINE = 0
BYTECNT = 0
PNTNAME2$ = PNTNAME$ & "CNVT"
OPEN #2:PNTNAME2$,OUTIN,BINY,RECSIZE 1
     TYME$ = TIME$
     GOSUB HEADER
     FOR I = 512 TO A-1
       READ #1,RECORD I:BYTE@:GOSUB WRITEBYTE
       IF BYTE@ > 128 THEN GOSUB REPEATER ELSE GOSUB MIXED
       IF SCANLINE > 400 THEN GOTO TERMINATE
     NEXT I
END
REPEATER:
     COUNT = 256 - (BYTE@ - 1)
     I = I + 1
     READ #1,RECORD I:BYTE@
     GOSUB WRITEBYTE
       BYTECNT = BYTECNT + COUNT
       IF BYTECNT = 72 THEN GOSUB PADDING
     RETURN
MIXED:
     COUNT = BYTE@ + 1
     FOR MXCT = (I + 1) TO (I + COUNT)
       READ #1,RECORD MXCT:BYTE@
       GOSUB WRITEBYTE
     NEXT MXCT
     BYTECNT = BYTECNT + COUNT
     I = I + COUNT
       IF BYTECNT = 72 THEN GOSUB PADDING
     RETURN
PADDING:
     BYTE@ = 249
     WRITE #2, RECORD J:BYTE@
     J = J + 1
     BYTE@ = 255
     WRITE #2, RECORD J:BYTE@
     J = J + 1
     BYTECNT = 0
     SCANLINE = SCANLINE + 1
     SET HPOS 10:SET VPOS 10:PRINT "SCANLINE = ":SCANLINE
     RETURN
WRITEBYTE:
     WRITE #2, RECORD J:BYTE@
     J= J + 1
     RETURN
TERMINATE:
     TYME2$ = TIME$
     SET HPOS 10:SET VPOS 15:PRINT TYME$,TYME2$
     ASK EOF #2, A
     A1 = A
     IF REMAINDER(A1,512) <> 0 THEN GOSUB FILL
     CLOSE #2
     OPEN #2:PNTNAME2$,OUTIN,BINY,RECSIZE 2
     SIZE$ = A1 - 8
     J = 3
     WRITE #2, RECORD J:SIZE%
     J = 62
     SIZE% = A1 - 126
     WRITE #2, RECORD J:SIZE%
     CLOSE #1
     CLOSE #2
END
FILL:
     BYTE@ = 0
     A1 = (INT(A/512) * 512) + 512
     WRITE #2,RECORD A1-1:BYTE@
     SET EOF #2,A1
     PRINT A,A1
     RETURN
HEADER:
     FOR J = 0 TO 125
       READ BYTE
       BYTE@ = BYTE
       WRITE #2,RECORD J:BYTE@
     NEXT J
     RETURN
DATA 70,79,82,77,0,0,3,150,73,76,66,77,66,77,72,68,0,0,0,20,2,128,1,144,0,0,0,0,1,2,
1,0,0,1,
DATA 20,11,2,128,1,144,67,77,65,80,0,0,0,6,0,0,0,240,240,240,67,82,78,71,0,0,0,8,0,
0,0,0
DATA 0,1,20,31,67,82,78,71,0,0,0,8,0,0,10,170,0,1,3,7,67,82,78,71,0,0,0,8,0,0,10,170
DATA 0,1,0,0,67,82,78,71,0,0,0,8,0,0,10,170,0,1,0,0,66,79,68,89,0,0,3,32
```

Illustration 1

MacGeisha

```
Blck: 0 Part A

0000: 0000 0002 FFFF FFFF FFFF FFFF DDFF 77FF    ..............w.
0010: DDFF 77FF DD77 DD77 DD77 DD77 AA55 AA55    ..w..w.w.w.w.U.U
0020: AA55 AA55 55FF 55FF 55FF 55FF AAAA AAAA    .U.UU.U.U.U.....
0030: AAAA AAAA EEDD BB77 EEDD BB77 8888 8888    .......w..w....
0040: 8888 8888 B130 031B D8C0 0C80 8010 0220    .....0.........
0050: 0108 4004 FF88 8888 FF88 8888 FF80 8080    ..@.............
0060: FF08 0808 8000 0000 0000 0000 8040 2000    .............@ .
0070: 0204 0800 8244 3944 8201 0101 F874 2247    .....D9D.....t"G
0080: 6F17 2271 55A0 4040 550A 0404 2050 8888    ..qU.@@U... P..
0090: 8888 0502 BF00 BFBF B080 B0B0 0000 0000    ................
00A0: 0000 0000 8000 0800 8000 0800 8800 2200    ..............".
00B0: 8800 2200 8822 8822 8822 8822 AA00 AA00    ..".."."."."....
00C0: AA00 AA00 FF00 FF00 FF00 FF00 1122 4488    ..............".D.
00D0: 1122 4488 FF00 0000 FF00 0000 0102 0408    .".D............
00E0: 1020 4080 AA00 8000 8800 8000 FF80 8080    . @.............
00F0: 8080 8080 081C 22C1 8001 0204 8814 2241    ......"........"A
```

[MacPaint file header's first 256 bytes. The entire 512 byte header may be ignored, as it contains only incidental data.]

Illustration 2

MacGeisha

```
Blck: 1 Part A

0000: F900 0003 CCFF 00FE F800 F900 0003 CC00    ................
0010: 0006 F800 F900 0003 CC00 0006 F800 F900    ................
0020: 0003 CC00 0006 F800 F900 0003 CC00 0006    ................
0030: F800 F900 0003 CC00 0006 F800 F900 0003    ................
0040: CC00 0006 F800 F900 0003 CC00 0006 F800    ................
0050: F900 0003 CC00 0006 F800 F900 0003 CC00    ................
0060: 0006 F800 F900 0003 CC00 0006 F800 F900    ................
0070: 0003 CC00 0006 F800 F900 0003 CC00 0006    ................
0080: F800 F900 0003 CC00 0006 F800 F900 0003    ................
0090: CC00 0006 F800 F900 0003 CC00 0006 F800    ................
00A0: F900 0003 CC00 0006 F800 F900 0003 CC00    ................
00B0: 0006 F800 F900 0003 CC00 0006 F800 F900    ................
00C0: 0003 CC00 0006 F800 F900 0003 CC00 0006    ................
00D0: F800 F900 0003 CC00 0006 F800 F900 0003    ................
00E0: CC00 0006 F800 F900 0003 CC00 0006 F800    ................
00F0: F900 0003 CC00 0006 F800 F900 0003 CC00    ................
```

[The first byte of the drawing data is a counter byte,(in this case a repeating counter), the second the bit-image byte to be written to the screen. Thus the 8 bit image of blank (white) pixels is to be drawn 8 times in succession.]

Illustration 3

MACGEISHACNVT

```
Blck: 0 Part A

0000: 464F 524D 0000 2BF8 494C 424D 424D 4844    FORM..+.ILBMBMHD
0010: 0000 0014 0280 0190 0000 0000 0102 0100    ................
0020: 0001 1408 0280 0190 434D 4150 0000 0006    ........CMAP....
0030: 0000 00F0 F0F0 4352 4E47 0000 0008 0000    ......CRNG......
0040: 0000 0001 141F 4352 4E47 0000 0008 0000    ......CRNG......
0050: 0AAA 0001 0307 4352 4E47 0000 0008 0000    ......CRNG......
0060: 0AAA 0001 0000 4352 4E47 0000 0008 0000    ......CRNG......
0070: 0AAA 0001 0000 424F 4459 0000 2B82 F900    ......BODY..+...
0080: 0003 CCFF 00FE F800 F9FF F900 0003 CC00    ................
0090: 0006 F800 F9FF F900 0003 CC00 0006 F800    ................
00A0: F9FF F900 0003 CC00 0006 F800 F9FF F900    ................
00B0: 0003 CC00 0006 F800 F9FF F900 0003 CC00    ................
00C0: 0006 F800 F9FF F900 0003 CC00 0006 F800    ................
00D0: F9FF F900 0003 CC00 0006 F800 F9FF F900    ................
00E0: 0003 CC00 0006 F800 F9FF F900 0003 CC00    ................
00F0: 0006 F800 F9FF F900 0003 CC00 0006 F800    ................
```

Illustration 4

Should a classic be colored?

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Number of Pins in Head: 9
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Line Spacings: 1/6" or programmable
Character Set: Full 96-character ASCII with descenders, 11 international character sets, 96 italic characters and 32 graphic characters

Column Width

Pica-sized/Emphasized: 136 Maximum characters per line
Enlarged: 68 Maximum characters per line
Condensed: 233 Maximum characters per line
Condensed Enlarged: 116 Maximum characters per line.
Elite-sized: 163 Maximum characters per line
Elite-sized Enlarged: 81 Maximum characters per line

Interface

Standard: Centronics-style 8-bit Parallel

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Fanfold Paper: Paper Width – 4" to 15.5", (101.6mm to 393.7mm)
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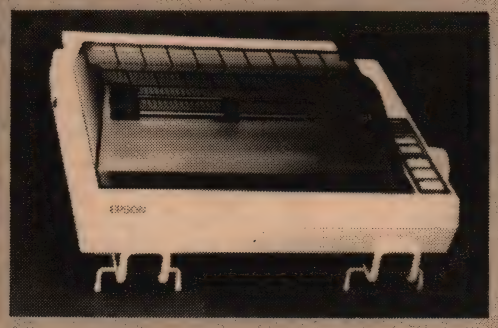

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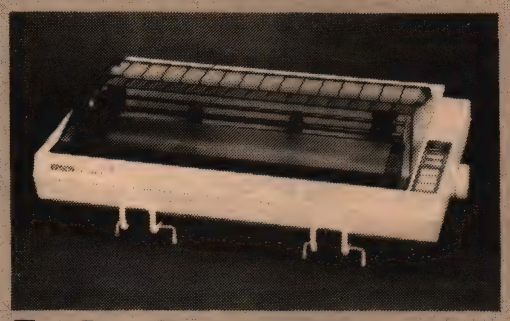

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The Apple Memory Map

by Philip Chien

On March 20, 1977 at the West Coast Computer Faire the Apple II was first introduced to the public. Since this is the tenth anniversary of that roll out, it's only appropriate that we look back, and take a close look into how the Apple's memory map works. Even if you don't have an Apple that old, this article will tell you why everything is placed in your Apple where it is, and how that memory is used.

First, let's set some ground rules for this article. Apple II refers to any member of the Apple II family. Original Apple II refers to the Integer Apple II which was first introduced ten years ago. Most numbers are expressed in hex, which explains why all computer programmers have 16 fingers—except those who learned on DEC machines, they only use 8 fingers.

Today the Apple's memory map looks like a hodgepodge of mixed up, and strangely placed locations. Why is the HIRES memory placed in the middle of nowhere, why is the I/O placed at $C000, why is the text screen jumbled up? In 1987 these "Apple quirks" are unnecessary and confusing, but in 1977 they helped make the Apple one of the most sophisticated computer designs.

The original Apple II's microprocessor was the 6502. Late on it was replaced with the CMOS version, the 65C02, and the 16 bit 65C816 in the Apple IIgs. The 6502 is an 8 bit processor, and it can access 64K of memory ($0000 to $FFFF). The 6502 requires a zero page at the bottom of memory, and a RESET location at the top of memory. Consequently the Apple has ROM locations from $D000 to $FFFF, and a zero page at the bottom of memory. Woz decided to produce the original Apple II with 6K of ROM (2K System monitor, 1K utilities, 5K Apple BASIC), but he allowed 2K more ROM expansion space for future ROM utilities, or enhancements to BASIC. Underneath the 12K of ROM 4K of I/O space was provided. Placing the I/O high in the memory gave the Apple the potential to expand to 48K of RAM on the motherboard—even though that "vast" amount of memory wasn't even available at the time. The standard memory chip for the earliest original Apple IIs was 2114 4K static RAMs. Each chip held 4K bits of RAM, and a row of eight chips combined to form 4K bytes of RAM. Up to three rows of RAM could be placed on to the Apple II motherboard, making a grand total of 12K of RAM! (wow!) 4116 16K dynamic RAM chips were just becoming available

continued on page 237

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Premiering at the show was the Data Exchange, the first mass storage subsystem to link the Macintosh and Apple IIe/gs, enabling them to share files and exchange data. The Data Exchange is comprised of a 320 Mbyte hard disk subsystem with an 18 ms. average access time and proprietary software that allows the two personal computer families to share data.

Also making its debut at the show was the S-40, a 40 Mbyte 3.5" SCSI hard disk drive. Featuring an average access time of 29 ms., the S-40 is fast and compact.

In addition, CMS is introducing the SCSI II Interface Card, a SCSI interface board, and the Data Tower, a high-performance hard disk subsystem with a choice of 140, 240 or 320 Mbytes of mass storage memory.

Other products on display include the S-20, a 20 Mbyte hard disk drive, and the S-220, a dual 20 Mbyte external hard disk drive. Both products utilize the Small Computer Systems Interface (SCSI), and are compatible with the Apple IIe/gs via the SCSI II Interface Card and with the Macintosh.

For additional information contact CMS Enhancements Inc., 3080-A Airway Avenue, Costa Mesa, CA 92626; (714) 549-9111.

Mention that you read about it in *Computer Shopper*. ●

Apple Memory Map continued from page 236

as the Apple was introduced, and Woz provided the proper refresh circuitry to make it easy to expand memory in rows of 16K RAMs up to 48K. The refresh circuitry was provided without any extra chips, or circuitry. Woz designed the video generator in the Apple to refresh the dynamic RAM each time it updated the video screen. Since the video circuitry has to be updated each time the screen is redrawn (a requirement of the NTSC standard) it automatically takes care of the RAM refresh!

The text page is oriented in a scrambled interlaced method which has driven many programmers crazy, and confused many experienced programmers. The problem is how can you create a 40 column 24 line display (limited to NTSC TV standards) with as little memory as possible. Each line of memory should start with an even memory address to make the video circuitry as simple as possible. If you map the memory in a convenient simple matrix, you will have to waste 24 bytes per line (the difference between 64 bytes and 40 columns) and the text display will take 1536 bytes of memory. The Apple interlace takes only 1024 bytes for its display, and it displays 960 characters. Only 64 bytes are "wasted," and those bytes are assigned to each of the Apple's expansion slots. Each slot gets eight RAM locations dedicated to it, making cards less expensive, since they don't need their own memory chips. The end result is a savings of a whopping 512 bytes (½K) of RAM, not much in 1987 but plenty of memory for a 4K 1977 original Apple II.

Out of necessity, even a minimal 4K Apple must have standard built-in locations, such as the zero page, keyboard buffer, and text page. Consequently all of these must be located at the bottom of memory. It was expected that most users would be purchasing an Apple with at least 16K of memory, and most users would want to use HIRES graphics. So one HIRES page was placed at the top of the first 16K of memory ($2000-$4000). The end result was an Apple with as little as 16K of RAM could use HIRES graphics, and even a minimal 4K Apple could still use the LORES graphics (just a different way of displaying the data in the text page).

Besides a standard text/-LORES graphics page, and a HIRES graphics page, Woz also provided a second text and HIRES page for high speed animation. With two pages it is possible to draw on one page while showing another, and flipping between the two pages for smooth pictures.

The expansion slots on the Apple are quite well designed, and have become one of the Apple's most popular features. Over 10,000 different cards have been produced by various companies, and even though the Apple IIc is less expensive than an Apple IIe, and includes most accessories as built-in features, it doesn't sell as well since it doesn't have expansion slots.

The original Apple II came with eight expansion slots. Seven of the slots (slots 1 to 7) have 256 bytes of memory locations dedicated, and each of the eight slots has 16 I/O locations. In addition the slots share 2K of space, and slots can "grab" memory from other areas as necessary. Besides memory locations each slot has all of the microprocessor's signals available, and a variety of other signals. Each card gets all four voltages (+5V, −5V, +12V, −12V) pre-regulated and filtered.

In 1977 all of the above was fine, and the Apple's expansion capabilities were considered quite adequate. I purchased my Apple with the "massive" amount of 16K of RAM, and was quite happy—after all, it was twice as much memory as the PDP-8 which I used to use.

The first significant change to the memory map of the Apple was an alternative to the built-in ROM. Apple BASIC is a very fast, efficient, bug-free BASIC—but it's an Integer BASIC, and it isn't a standard programming language. By this time two different accessory ROMs had become available for the Apple II, the Superchip—a set of HIRES character drawing routines, and the Programmer's Aid #1. Both chips were designed to be used in the same socket, the D0 location, and since the Programmer's Aid was sold by Ap-

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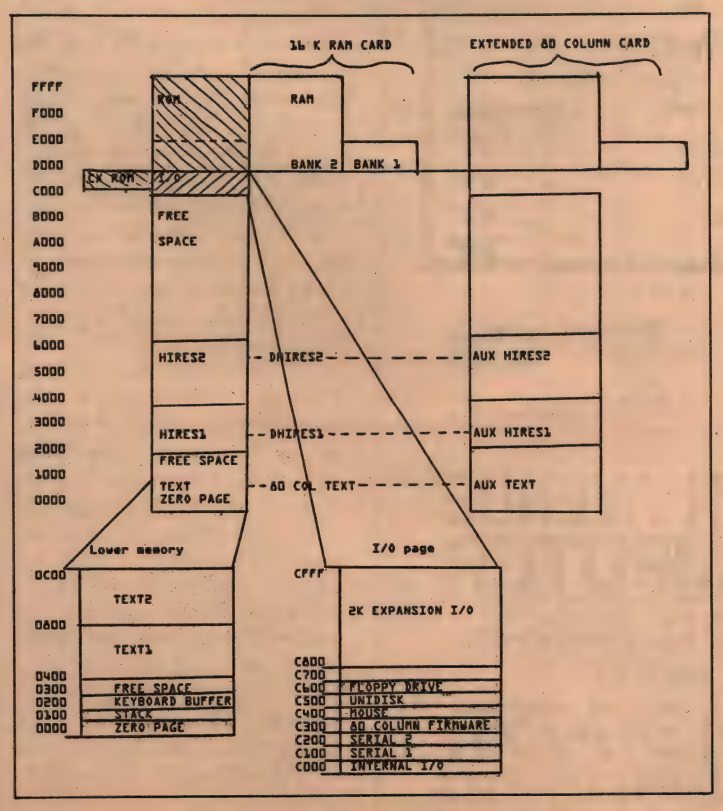

Apple II Memory Map

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Apple Memory Map
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ple it quickly became the standard. Eventually Apple included it free with each Apple II sold, and in later disk oriented versions of Integer BASIC the Programmer's Aid was included. In 1978 Apple introduced Applesoft II BASIC, an enhanced version of Microsoft BASIC which included built-in support for LORES and HI-RES graphics. Applesoft was available as a RAM based program which could be loaded from a cassette, or as a ROM card. The ROM card plugged into slot 0, and electrically replaces the built-in Integer BASIC ROMs. The Applesoft ROM card included the 10K enhanced version of Microsoft BASIC, and it quickly became the standard de facto programming language for the Apple II.

By 1979 48K Apples became standard, and most Apple owners used Disk II drives instead of cassette tapes (remember those?) for storage. 48K which seemed like a much too expensive, much to extravagant amount of memory a couple of years ago was now considered affordable, and the standard. Although Applesoft BASIC was the standard, Apple computer wanted to release a more powerful, structured programming language and operating system. The UCSD P-system was chosen, with the UCSD Pascal programming language. Since the memory space used by the Apple's internal ROMs would be wasted (very few BASIC routines are needed by Pascal) the decision was made to create a new memory expansion card, the Apple Language card. The name of the card implied that Apple was planning on releasing a variety of different languages for the card, not just Pascal. As it turned out a variety of different purposes have been used for the extra memory, including languages, operating systems, program space, and variable storage. The Language card came with 16K of RAM. Since the ROM it replaced occupied only 12K of space, the memory on the Language card partitioned the memory as a 12K bank, and a 4K bank. The extra 4K bank occupied locations $D000-$DFFF, and for compatibility with the earlier ROM card, the extra bank is referred to as Bank 1, and the standard bank is referred to as Bank 2. The extra 4K of memory was there simply because it's easier to make a peripheral with 16K of memory than 12K, and usually the extra 4K goes wasted. In almost all cases for every 16K card you add, you get an extra 12K memory for your program. The Apple Language card also had another unusual feature, a pigtail cable which attached to the Apple's motherboard. The pigtail cable replaced a RAM chip, and provided the refresh signals from the Apple's motherboard to the Language card. Besides the Pascal language, the Language card also replaced the Apple ROM card and Applesoft BASIC and other languages could also be loaded onto the card.

By this time another change was also made to the original Apple II. The Integer ROMs were replaced with the Applesoft ROMs which were on the Applesoft ROM card, and the standard F8 monitor program was replaced with the Autostart ROM, which automatically boots the disk drive when an Apple is powered up. The new Apple, referred to as the "Apple II Plus" just replaced Apple BASIC with Applesoft BASIC as the default built-in language, and made Apple Integer BASIC the alternate language available either as a ROM or with the Language card.

The Language card, and UCSD System helped standardize Apple memory expansion, and slot assignments. Under the UCSD System a printer is placed into slot 1, a modem or other I/O device is in slot 2, a terminal is in slot 3, and the standard disk drive is in slot 6.

Although these standards were just established for the UCSD System, users used the same default locations for other operating systems also. The UCSD System originally intended for an external terminal to be attached to a serial card in slot 3, but many second party manufacturers went one step further. 80 column cards quickly followed the P-system. An 80 column card is literally an entire terminal without a keyboard or monitor. The Apple's normal keyboard and monitor are used, and the 80 column card operates directly off the Apple's expansion connector. Since then a variety of different 80 column cards, and methods have been introduced, and for compatibility reasons they all emulate the early 80 column cards which plug into slot 3.

The next big expansion in the Apple's power came not from Apple, but from another company, Microsoft. What was particularily significant was the expansion didn't involve the 6502 microprocessor—it involved the Z-80. Microsoft produced the Z-80 card, a DMA microprocessor which could take over control of the Apple from the 6502. To go with the Z-80 board Microsoft purchased a license for the popular CP/M operating system. Microsoft CP/M used the same I/O standards as the P-system, and consequently any accessory which would work with Pascal would also work with CP/M. The Apple's 6502 still controlled I/O operations, but the Z-80 made the Apple truly CP/M compatible. Most major CP/M software houses decided to support the Apple CP/M disk format, and very quickly programs like Wordstar and dBase, which Apple owners only heard and dreamed about quickly became available. Somewhat ironically within five years most manufacturers of CP/M machines had changed over to producing MSDOS machines, and many old CP/M diehards have converted to Apples—the only machines in production still actively supporting CP/M!

In 1980 Apple took a giant step. Whether it was a step forward or backwards depends on who you talk to. With great fanfare the Apple III was introduced at NCC. Apple chartered buses, and even rented out Disneyland for a night to introduce its newest child. For a variety of technical and marketing reasons the Apple III was always considered the step-child of the Apple II Plus (and later the Apple IIe and Macintosh) and production was stopped in 1984 after "only" 100,000 units were sold. The Apple III's memory map is an article by itself, but suffice to say it wasn't compatible enough with the Apple II Plus. It didn't emulate the Language card, and its slot assignment was in direct defiance of the already established standard.

The keyboard and 80 column circuitry from the Apple III did make it into the next, and most successful Apple product. On January 19, 1983 the Apple IIe was introduced. It updated many of the early

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Internal I/O

C0FF	
C0F0	SLOT 7 I/O
C0E0	SLOT 6 I/O
C0D0	SLOT 5 I/O
C0C0	SLOT 4 I/O
C0B0	SLOT 3 I/O
C0A0	SLOT 2 I/O
C090	SLOT 1 I/O
C080	SLOT 0 I/O
C070	PADDLE STROBES
C060	CASSETTE INPUT & INPUT BUTTONS
C050	GRAPHICS & ANNUNCIATORS
C040	STROBE
C030	SPEAKER
C020	CASSETTE OUTPUT
C010	KEYBOARD STROBE
C000	KEYBOARD

Text page map

	n00	n28	n50	n78
0400	LINE 0	LINE 8	LINE 16	SCREEN HOLES
0480	LINE 1	LINE 9	LINE 17	
0500	LINE 2	LINE 10	LINE 18	
0580	LINE 3	LINE 11	LINE 19	
0600	LINE 4	LINE 12	LINE 20	
0680	LINE 5	LINE 13	LINE 21	
0700	LINE 6	LINE 14	LINE 22	
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Apple Memory Map continued from page 238

"features" in the Apple II Plus, including an upper/lowercase keyboard and character set, 64K of memory built-in, and more expansion capability while keeping an unheard of 90% compatibility with hardware and software designed to work with the Apple II and Apple II Plus. In addition it reduced the chip count on the motherboard from over 100 chips to less than 40. Part of that chip reduction was in the RAM. On an Apple II Plus it takes 32 4116 16K RAM chips to make 64K, on the IIe it takes only 8 4164 64K chips. In the newest Apple IIes with the built-in keypad and platinum case the 4164 64K 1 bit RAM chips have been replaced with 4464 64K 4 bit chips, reducing the chip count even further. Although the IIe has 64K of memory on the motherboard, (16K more than the Apple II Plus) the memory is arranged to emulate a 48K Apple with a 16K Language card.

Besides extra RAM, the IIe also included extra ROM routines. Enhancements like the 80 column firmware, reset and memory test, and AUX memory routines couldn't fit into Applesoft, and more memory space was required. Apple solved this problem by having a softswitch electrically switch the I/O space with an extra bank of ROM. The CD ROM in the IIe includes the CX ROM space, which occupies $C100 to $CFFF when it is needed. With the enhanced Apple IIe unused routines like cassette were removed, and replaced with the search, step, trace, and mini-assembler routines. The monitor ROM in the IIe makes the switching invisible to the user, and the only time most users encounter the CX switch is when modifying an Apple for an absolute RESET routine.

The Apple IIe 80 column card is based on the design of the Apple III's 80 column circuitry (which explains why the copyright date on the card says 1980 instead of 1983). It interlaces two banks of text to create an 80 column display. The 80 column card included its own 1K of memory in a separate bank of memory totally apart from the 64K memory bank. Odd columns are stored in the main memory on the Apple's motherboard, and even columns are stored on the 80 column card, in a separate bank of memory. The Apple extended 80 column card very quickly became an obsolete antique. Within a couple of months it was quickly supplemented, and later replaced, by the extended 80 column card.

The extended 80 column card takes the 80 column card's 1K memory several steps further. Instead of only 1K of memory in an auxiliary bank, it includes an entire 64K bank of memory, mapped identically to the standard 64K on the IIe's motherboard. On all but the very earliest Apple IIe's if you have an extended 80 column card you can also double the horizontal resolution of the HIRES display, in a similar method to show text is doubled from 40 to 80 columns.

DoubleHIRES regrettably isn't supported by the IIé or any other Apple in firmware, but many second party and public domain articles have come out showing how to use it, making 560x192 graphics relatively easy to use. What isn't documented well is that besides a double text (80 column display) and a double-HIRES mode, the IIe also can support double LORES graphics, a second 80 column text/LORES display and a second double HIRES graphics mode. In many cases the firmware will shut off the second screen when you select double resolution modes, but it is quite possible for a properly written program to use both sets of graphics screens.

From the memory point of view the Apple IIc is basically an Apple IIe with a built-in extended 80 column card. 128K of RAM is included on the motherboard, and either 16K or 32K of ROM, depending on which version of the Apple IIc. The memory on the IIc is still arranged as a 48K Apple with a 16K Language card, plus a second 64K bank emulating the extended 80 column card. All of the I/O and mapping is handled by the MMU (Memory Management Unit) chip, and transparent to the user. The ROM routines in the IIc are similar, although not identical to the IIe routines, and include the ROM routines for the built-in ports (a/k/a "slots"). The IIc adheres to the P-system standard, and uses the standard slot assignments. When the Unidisk was released the IIc's ROM was upgraded to 32K, and a full set of protocol routines was added to support it, and other block I/O devices.

Memory expansion beyond Apple's standard capabilities has always been popular. Legend Industries introduced a 64K RAM card way back in 1981 which emulated four 16K RAM cards "glued" together. Each of the three extra 16K banks looked like another 16K RAM card, and an unused softswitch was used to select the various banks. That card has been re-tooled, and the "S" card can now hold 1 Meg of RAM, arranged as 256 16K banks. The card is designed for use in the Apple II Plus, but it will also work in the Apple IIe. Most software, however has been designed to work with newer RAM cards designed specifically for the Apple IIe which use the extended 80 column design. There are a variety of extended 80 column cards, most notably RAMworks by Applied Engineering. These cards expand the IIe in 64K banks, each bank emulating an entire 64K extended 80 column card. With 256K RAM chips it is quite easy to fit a Meg or more within the Apple IIe's case, and with an external expansion board it is possible to address up to 16 Meg(!) of memory—all arranged as 64K banks.

Looking at the Apple's memory map diagrams it's quite easy to see how complicated and confusing it is to use all of that extra memory. Traditionally most memory boards offer RAMdisks for popular operating systems, and an Appleworks memory expansion program. Very few programs use the extra 4K of memory in each 64K since it usually isn't worth the extra effort, and usually that memory is wasted.

Enter the magic chip which solves the Apple's memory map problems. Western Digital Center produced the 65C816, a true 16 bit version of the 6502. It looks like 65C02, and will operate as a 65C02 in its 8 bit emulation mode where it can address 64K, but in its native 16 bit mode it can address 16 Mbytes. A properly designed Apple can use a 65C816 in the 8 bit mode to run present Apple II programs, and in the 16 bit mode it can be used to access much larger portions of memory. The key phrase in the last sentence is "properly designed." Since the 65C816 requires more address lines to access larger amounts of memory, it cannot plug directly into an Apple. WDC addressed this problem by also producing the 65C802. The 65C802 is pin compatible with the 65C02, and it can be plugged directly into a 6502 socket. It has the entire 65C816 instruction set, but out of necessity it can only address 64K at a time, just like the 6502 it replaces. Incidentally, this is the chip many manufacturers often advertise as a "16 bit upgrade" for the Apple. It's only 16 bit in that it has the 16 bit instruction set. But it is NOT a 16 bit chip.

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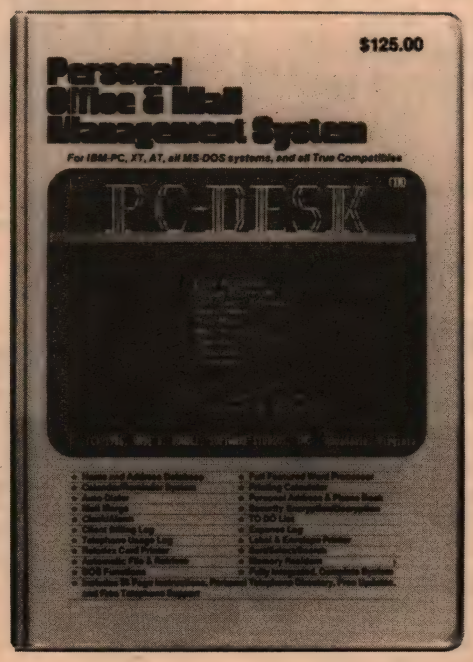

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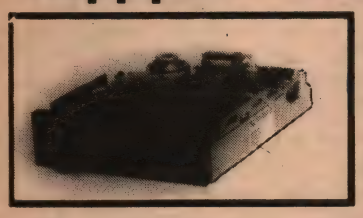

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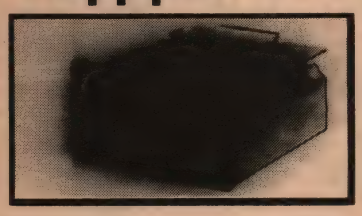

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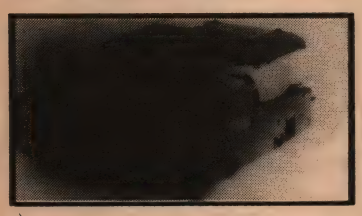


5 Meg ..... $99 ea
FULL HIGH
10 Meg ..... $139 ea
FULL HIGH
Formats to 10 Meg.
20 Meg ..... $235 ea
½ HIGH
Formats to 20 Meg.
40 Meg ..... $349 ea
FULL HIGH
Formats to 32.8

MONTHLY SPECIAL

Tape Backup Systems

20 Meg .... $359 ea
Internal
20 Meg .... $579 ea
External

Internal Backup

TALLGRASS TECHNOLOGIES
COMMITTED TO MEMORY

40 Meg .... $569 ea
Internal
40 Meg .... $799 ea
External

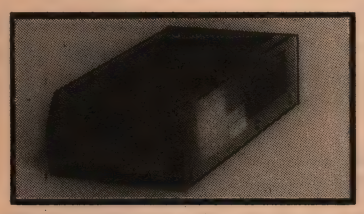
External Backup

Operates with all 4.77, 6 and 8 MHz. systems. Internal Units come complete with controller card, cable, users manual, file by file and image software.

External Units — same as above, plus external case. All backup systems use standard DC2000 quarter inch cartridges

MONTHLY SPECIAL

ASTEC 65 Watt Switcher



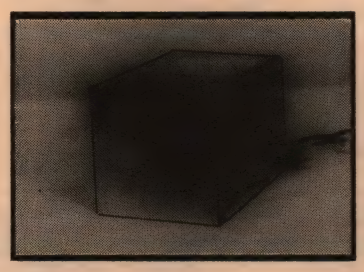
Outputs
+ 5 @ 6.0A
+ 12 @ 1.5A
+ 12 @ 2.1A
- 12 @ .25A
DC

Replacement for Tandy Model IV
KAYPRO-EAGLE

$39 ea 2 For $65

Dimensions: Length 8.0", Width 4.4", Height 2.4"

200 Watt Power Supply

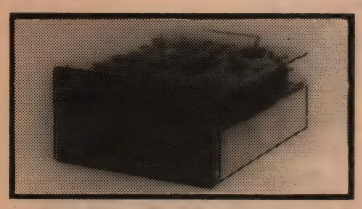


For IBM-AT and Compatibles

$129 ea

+ 5V - 7.0 - 20 AMPS
+ 12V - 2.5 - 7.3 AMPS
- 12V - 0 - 0.3 AMPS
- 5V - 0 - 0.3 AMPS

Double your Disk Drive Capacity



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Compatible with all IBM software PC DOS (3.1)
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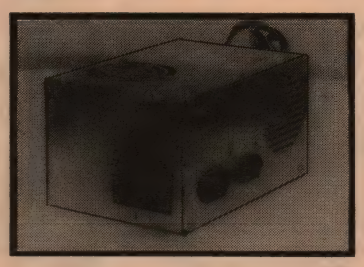
Includes Software

$79 ea Includes Software

Device Driver Sold Separately for $30

165 Watt Power Supply



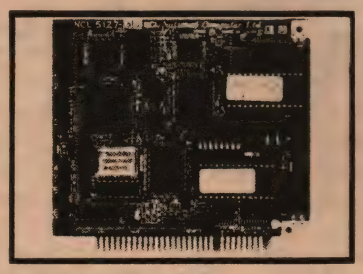
For IBM-XT and Compatibles

$79 ea

+ 5V - 2.3 - 15 AMPS
+ 12V - 0.4 - 7 AMPS
- 12V - 0 - 0.25 AMPS
- 5V - 0 - 0.3 AMPS

PERIPHERAL SALE

NCL 5127 Winchester Disk Controller For the IBM PC/XT and Compatibles



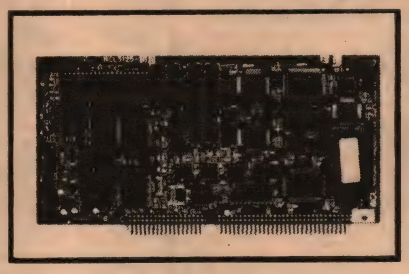
$109 ea

The NCL 5127 allows the user various options and applications from desk tops to portables. It's compact size is achieved through CMOS surface mount technology without sacrificing performance or quality.

*Add $6 for Set of Cables

- ST 506/412 Interface
- Drive Power Connector
- Switch Selectable Drive Types
- 625Kbyte Data Rate
- Operates With PC-DOS and MS-DOS
- Compact Size (3.9"x4.7")
- Automatic Surface Scan During Format
- Partition Option for High Capacity Drives
- Supports up to 16 Heads and 1024 Cylinders
- Programmable Interleave

NCL 5125 Winchester/Floppy Disk Controller For the IBM AT and Compatibles



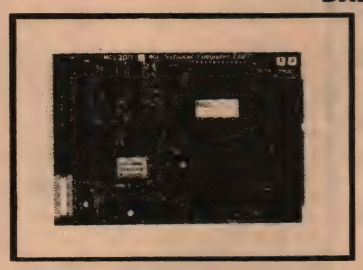
$199 ea

The NCL 5125 is a compact Winchester/Floppy combination controller retaining the "XT" height utilizing surface mount technology.

- Compact Size (3.9"x8")
- ST 506/412 Interface
- Controls Up to 2 Winchesters
- Supports Concurrent
- 32 Bit ECC
- Supports 1.2 Mbyte and 360 Floppy Drives
- 2 Mbyte Data Transfer
- Supports up to 16 Heads and 2048 Cylinders
- Overlapped Seeks

NCL 3011 SASI/3016 SCSI

Winchester Disk Controller SASI/SCSI Interface Compatibles



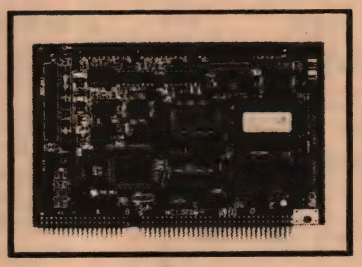
$149 ea

NCL offers you the choice of either SASI or SCSI interface capabilities by utilizing full scale IC integration in a compact 3.5" form factor board.

NCL 3011 SASI
- Compact Size (4"x5.75")
- 1 Mbyte/sec Transfer
- One to One Interleave
- Supports up to 16 Heads

NCL 3016 SCSI
- Compact Size (4"x5.75")
- 1.5 Mbyte/sec Transfer
- Disconnect/Reconnect and Arbitration
- Intelligent Bus (Multiple Hosts)

NCL 5126 Winchester Disk Controller For the IBM AT and Compatibles

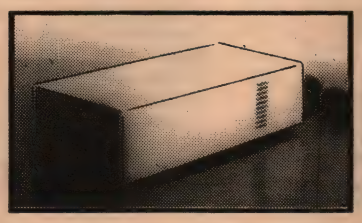


$179 ea

The NCL 5126 is designed exclusively for Winchester only allowing the floppy chip to reside on the main CPU board.

- Compact Size (3.9"x6")
- 2 Mbyte Data Transfer
- Controls Up to 2 Winchesters
- Supports Concurrent Data Operations
- 32 Bit ECC
- ST 506/412 Interface
- 16 Bit Data Transfer
- Supports up to 16 Heads and 2048 Cylinders
- Programmable Disk Parameters
- Overlapped Seeks

External Hard Disk Case with Power Supply

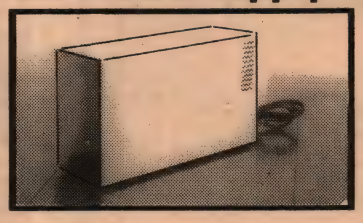


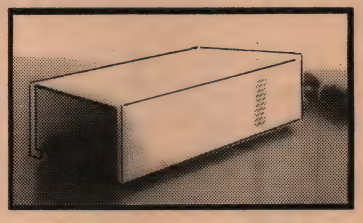
Case for (1) Full High Hard Drive ..... HD-2 ..... $89 ea
will accommodate 2 Half High Drives with 38 watt power supply

Same as above but with 76 watt power supply ..... HD-2A ..... $149 ea

All units come with 6 ft. power cord
Add $6 to cover shipping on each case
Cables for Case for IBM/PC/XT/AT and Compatibles ..... $27 ea

External Floppy Disk Drive Case with Power Supply





Case for (2) Half High Floppy Drives ..... FD-2 ..... $89 ea
complete with 38 watt power supply

Case for (1) Full High Floppy Drive ..... FD-1 ..... $59 ea
complete with 26 watt power supply

All units come with 6 ft. power cord
Add $6 to cover shipping on each case
Cables for Case for IBM/PC/XT/AT and Compatibles ..... $27 ea

TO ORDER:
Please send cashier's or certified checks ONLY
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Canadian residents add $10 shipping
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Credit Card Purchases Add 3%

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Ask The Guru
continued from page 108

by an entire pin row. Make sure your adaptor prevents this.

Unfortunately, that DB19 connector has been a bear to find. One good source is JDR. These are usually available in solder tail only, so a short cable may be needed between your PC card and the DB19.

What Is New In Mass Teleportation?

The rate at which science and technological fact outpaces science fiction continues to utterly astound me. Nowhere is this more apparent than in the emerging field of mass teleportation.

The exciting center of all that's recently been happening is the outstanding *International Journal of Teleportation and Mass Transfer*. In particular, check out Barfoot and Gentry's tutorial material way back in Volume XVIII, pages 1146-1198, along with their outstanding bibliography. And, for lots of hands-on construction details, see Chediski, Colcord, and Elden's low budget project in pages 1245-1277 of the same issue.

It sure is refreshing to see a scholarly journal that also remains simple, practical, and easily understood by lay people. It looks like the technology to watch is the quark-muon dissociation/regeneration process.

So, I guess I was not overly surprised when Marcia Swampfelder sent me her latest peripheral cards for the Apple II Plus, her MTT-T1 mass transferrence transmitter and her MTT-R1 mass transferrence receiver. Unfortunately, Marcia is a tad on the conservative side, so she insisted on using illegal monitor entry points that precludes the use of these cards on newer Apples.

The pricing is very attractive at $68.50 for the MTT-T1 and $43.50 for the MTT-R1.

Anyway, you plug the transmitter card into one Apple II Plus and as many as four receiver cards into four receiving Apple II Plus computers. Any object placed in the transmitter's dissociation chamber will get reconstructed in the regeneration chamber of the receiver.

The effective range depends on the telephone line in use, but for your average quality voice grade line, you can teleport objects up to 500 miles with a single receiver, 200 miles with two receivers, 100 with three, and 50 miles with four receivers. The little understood process of conjugate phase decongruence prevents you from reliably using more than four receivers, regardless of the distance.

The Apple power supply and baud rate considerations limits the size of the teleportation chambers. Those chambers on the MTT-T1 and MTT-R1 are slightly larger than a quarter. In the usual demo of these cards, you place a quarter in the chamber on the MTT-T1 card, and it reappears intact approximately 12 minutes later on the MTT-R1 card.

For a real "Golly Gee Mr. Science" demo, you can use four regeneration cards for one dissociation card. The single quarter you placed in the dissociation card chamber will simultaneously reappear in all four receiving cards, again in a twelve minute dissociation-regeneration time interval. Put another way, the quad demo returns a dollar in change for every quarter that is invested.

Marcia reports that just about all of her current production is going to importers of specialty herbs and spices. Her teleportion system eliminates all of the long delays at customs, besides allowing users to set their own international currency exchange rates.

Contact Marcia directly for more information.

How About Some More Applewriter Patches?

Sure thing. This month, we will just do a lightweight and

continued on page 244

This patch is for ProDOS Applewriter 2.0 version AWD.SYS only. AWD.SYS initially ran only on the 80 column IIc or the 128K IIe.

The patch improves the prompting tones when in the fast mode on a IIgs.

It works by lowering the pitch and lengthening the duration of each tone in the pair.

1. **Make a third or higher backup copy of ProDOS Applewriter 2.1, using the filer utilities. Plainly label this disk FOR IIGS ONLY!**
2. **Get into /BASICS.SYS. Then CALL -151 to get into the monitor.**
3. **BLOAD AWD.SYS, A$2000, E$6020, TSYS, D2**
4. **Verify 2260- 80**
   Change 2260: D0
5. **Verify 2265- A0**
   Change 2265: FF
6. **Verify 2267- 80**
   Change 2267: FF
7. **BSAVE AWD.SYS, A$2000, E$6020, TSYS.**

Fig. 2 - ProDOS Applewriter 2.0 tweedleifier patch.

This patch is for ProDOS Applewriter 2.1 version AWD.SYS only. AWD.SYS initially ran only on the 80 column IIc or the 128K IIe.

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5. **Verify 2265- A0**
   Change 2265: FF
6. **Verify 2267- 80**
   Change 2267: FF
7. **BSAVE AWD.SYS, A$2000, E$6020, T$0C.**

Fig. 3 - ProDOS Applewriter 2.1 tweedleifier patch.

```
% Postscript fontpath utility
%.....................

initgraphics 100 100 moveto

/Palatino-Bold findfont [100 0 0 100 0 0]
makefont setfont

(S) false charpath clip

newpath 90 90 moveto 0 250 rlineto 250 0 rlineto
0 -250 rlineto closepath clip clippath

save /snap exch def fill snap restore clear

/fix {} == flush mark 10 {37 sin pop} repeat} def

mark
{{moveto} fix}
{{lineto} fix}
{{curveto} fix}
{{closepath}fix (
) print flush} pathforall

pstack flush showpage
```

Fig. 4 - A Postscript fontpath utility.

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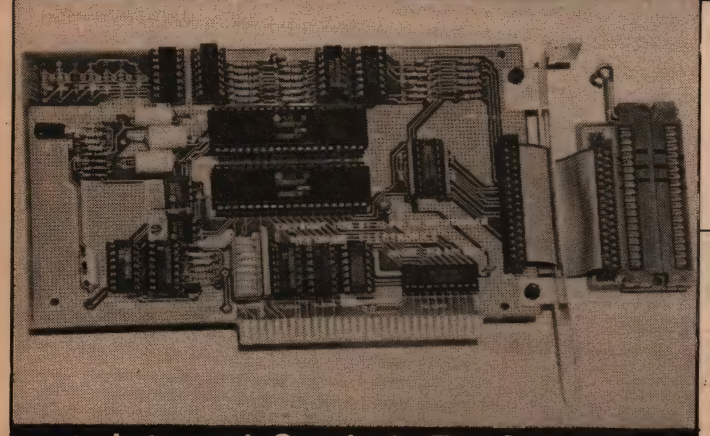

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*NEW INTELLIGENT AVERAGING ALGORITHM. PROGRAMS 64A IN 10 SEC., 256 IN 1 MIN., 1 MEG (27010, 011) IN 2 MIN. 45 SEC. INTERNAL CARD WITH EXTERNAL 40 PIN ZIF.
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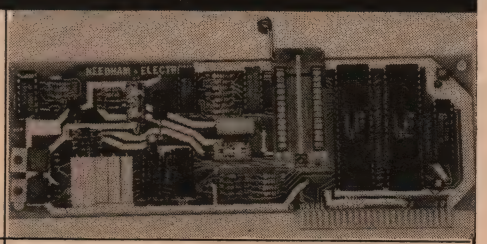
APPLE II, +, E
*NEW INTELLIGENT AVERAGING ALGORITHM. PROGRAMS 64A IN 21 SEC., 256 IN 1 MIN. 30 SEC.
$92.50 + S&H



- READS, VERIFIES AND PROGRAMS 2716, 32, 32A, 64, 64A, 128, 128A, 256, 512, 513, 010 (PC ONLY), 011, MCM 68764
- AUTOMATICALLY SETS PROGRAMING VOLTAGE
- MENU DRIVEN SOFTWARE
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Apple-CP/M

by Jesse D. Sheinwald

Word Processing

Word processing is the number one application of personal computers. Nothing else comes close. Confirmed technophobes, once they understand what the computer can do that their typewriters can't, never go back. After getting oriented towards word processing, using an ordinary typewriter is like being forced to climb steps wearing lead shoes. Writing by hand is like going to work on your hands and knees, pushing a lump of coal with your nose and having an eighteen-wheeler bear down on you. Word processing is powerful, addicting stuff.

Word processing has created a revolution in the way written ideas are put together and recorded. The microcomputer is the tool that has put this power into the hands of the masses.

At one time, a word processor was a major office machine that cost many thousands of dollars. With its integrated keyboard and monitor, dual eight-inch floppy disk drives, storage drawers and built-in letter quality printer it was an imposing affair. You didn't work at it, you worked in it. Let's not forget the cooling fan. The average room air conditioner makes less noise. It was a real machine, and completely out of reach for the individual.

The big office word processing machine has gone the way of the dinosaur, and the standard typewriter is now making its last thrashing gasps. Some new typewriters are making last ditch efforts at survival: memories, line displays and other such gimmicks. There is now an intermediary step: small self-contained word processors masquerading as typewriters: questionable performers and a doubtful value. With their rigid hardware configuration and built-in software they are fine for the not very adventurous. If you want to be in charge of your own writing destiny, there is nothing like a real computer with the word processing software of your choice.

The Two Basic Kinds

There are two major styles in the world of word processing software. First there is the family of What-You-See-Is-What-You-Get, spelled WYSIWYG pronounced "wisiwig." The most famous member of this group is the ever durable, ever difficult to learn, incredibly inefficient, WordStar. Do not get me wrong, I like WordStar and its newer, more efficient clone, NewWord, but the program is monstrous in size and complexity.

WYSIWYG word processors have several distinct advantages. First, what comes on the screen looks just like it will when it is printed out. This is nice and intuitive as the monitor screen becomes the exact analog for the sheet of paper. This is important when the physical placement of your printed information is critical. For example, I write virtually all of my correspondence using NewWord. When possible, I like to get the entire letter on one sheet of paper. My address, the recipients address and the body of the letter should look just right. A letter with the closing and your signature by themselves on a second sheet,

continued on page 244

Apple Memory Map
continued from page 239

A 65C816 cannot be plugged directly into the Apple's motherboard, however a properly designed piggyback board can be designed which replaces the Apple's 6502 and MMU chips. Once a IIe is upgraded, its memory can be addressed in a variety of modes. In the 65C02 emulation mode the 65C816 addresses memory in 64K banks, like the 65C02 it replaces. In its native 16 bit mode however, it can address any memory you have, up to 16 Mbytes as one bank of memory—the best of both worlds!

Can it be any surprise that Apple Computer decided to use the 65C816 in the Apple IIgs? We've run out of room this month, but next month we'll take a look into how Apple enhanced the memory map once more to create the IIgs, and we'll take some guesses as to what will happen in the future with the Apple II family. ●

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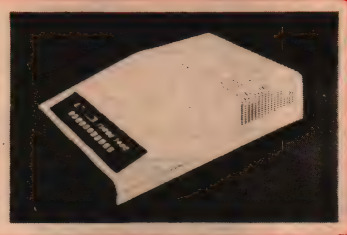
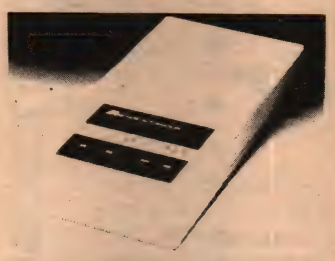
BY INCOMM DATA SYSTEMS



A new addition to Omni*Data's "hot seller" list. Incomm's Turbo 2400 intelligent modem is a 2400/1200/600/300 bps, auto-dial/auto-answer, Bell and CCITT compatible product designed to be UPGRADABLE to 4800 and also 9600 bps. This product is fully Hayes compatible not only at 1200 but also 2400 bps. "Help" screen options built in.
LOW, LOW PRICE: $329.95
With MNP: $379.95

VOLKSMODEM 1200 NOW JUST $129.95!!



VOLKS MODEM 1200

300/1200 bps. auto-dial/auto-answer, Hayes compatible smartmodem. Retails at $299.00 but now just $129.95! Comes complete with FIVE year warranty. Cables for Volksmodem 1200 only $10.95 with modem purchase. $14.95 without.

SIGNALMAN EXPRESS 1200
300/1200 bps, asynchronous, 100% Hayes identical smartmodem, plus dial tone busy detect and battery backed telephone number comment directory. LOW PRICE: $199.95

SIGNALMAN LIGHTNING 2400
300/1200/2400 bps, asynchronous, 2-wire full dupliex. Auto-dial/auto-answer, V-22 bis. Hayes command set compatible. Features multiple number storage, a speaker, battery backup and extensive diagnostics. ONLY: $299.95

SIGNALMAN MARK X
300 bps. Hayes compatible modem.
CLOSE OUT: $89.95

VOLKSi 1200
300/1200 bps, internal half-card for IBM PC, XT, and AT and compatibles. 100% Hayes compatible. Comes with "Access" software!
JUST: $119.95!!

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NOW AVAILABLE 9600/4800 BPS DIAL-UP MODEMS

New Case / Rixon 4600 series

CASE 4624 / VS
The 4624 VS operates at 2400 1200 300 bps and utilizes MNP classes 1, 2, and 3 for error-free transmission. V.22 bis and Bell 212 and 103 compatible. Uses Hayes and Microcom command sets. Retail $745.00; SPECIAL INTRO.
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CASE 4696 / VS
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PRICE: CALL

CASE 4648 / VS
This CASE modem features Class 5 MNP technology with effective throughput in excess of 4800 bps. V.22 bis, Bell 212 and 103 compatible. Compatible with Hayes and Microcom command sets. Retail $895.00; SPECIAL INTRO.
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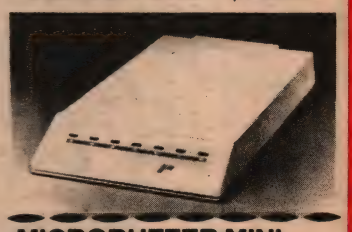

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DON LANCASTER'S LASERWRITER CORNER

To automatically collate your Laserwriter output, just place the printer on a two drawer filing cabinet and open the top drawer. The pages will automatically flop over into the right order.

• • •

The Postscript command that is used to select landscape printing is:

```
-90 rotate -792 0 translate
```

• • •

If you need exact front to back registration, a better than average image quality, or are using an older Laserwriter, it pays to add a time delay between each multiple copy so that the first sheet completely ejects before the next one starts to feed. This will eliminate any mechanical glitches caused by the shock of paper feeding.

One way to do this is:

```
/numcopies #copies 1 sub def
/#copies 1 def

numcopies {copypage 1800 {37 sin pop}
          repeat} repeat
showpage
```

Ask the Guru
continued from page 242

cosmetic pair of patches for both ProDOS Applewriter 2.0 and 2.1.

When you run Applewriter in the fast mode on the IIgs, the tweedle gets ridiculously high in pitch and very garish. The Tweedleifier patches of Figures 2 & 3 (page 242) reduce the pitch down to tones that sound acceptable both in the slow and fast modes.

This patch is recommended only for IIgs use.

Show Me A New Postscript Utility

In continuing our once-a-month series of the Postscript utilities for the Laserwriter and similar printers, Figure 4 (page 242) is a listing of the single most often asked for Postscript code.

This listing lets you return the exact path of any imaged character in any font to the host for study or modification. It works with all fonts from all sources, including all internal fonts, all externally downloadable fonts, and all custom fonts of your own.

The returned path is in its "open" or "trapezodial" form. It is a simple matter to convert the returned code to a much more compact and more useful path description by using the usual supervisory word processing utilities.

Many thanks on this utility go to the great people at the Berkeley chapter of Postscripters Annonymous, the leading detox clinic, halfway house and rehab center for chronic abusers of the Postscript language.

We'll wrap things up with our usual reminder that this is your column and you can get technical help per the ending box. Be sure to call or write for your copy of the free laser demo pack and the newly updated freebies list. ●

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Any Two	$79.95	$79.95	$59.95	$59.95	$59.95	$59.95
All Three	$99.95	$99.95	$79.95	$79.95	N/A	N/A

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Apple-CP/M
continued from page 243

is not the best of form. With NewWord (or WordStar) the letter always comes out looking as intended.

The editor/formatter is the second major style of word processing software. In an editor/formatter what you see is not what you get. Like the name says, the program consists of two main parts: the editor and the formatter. The editor is the program that allows you to enter your text. Since it is a very specialized application it does its job efficiently. Because the function of the editor is to get your information down, the writer is able to devote maximum attention to that task. All of the niceties of the printed document are temporarily ignored. Once the writing is finished you pop into the formatter program. Here is where the power over the final documents appearance is. Justification, line spacing, page numbering, and just about anything else to do with the finished product is under the control of the writer. Since the finished manuscript looks different from what is on the screen, it takes some practice to

continued on page 245

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Apple-CP/M continued from page 244

gain confidence using the formatting options.

Write

In the December 1986 *Computer Shopper* there was an excellent review for a word processing program called WRITE. This program from Workman & Associates (1925 E. Mountain St., Pasadena, CA. 91104, (818) 791-7979) is an excellent example of the editor/formatter type of text editor. WRITE is a fascinating and powerful program and, with a few rough edges, a surprisingly good fit for Apple-CP/M. I have found it to be the best program that I have used for the generation of larger documents. The recently announced pricing policy for WRITE ($99.95) makes it extra attractive. WRITE is often called a text editor rather than a word processor, probably because it was designed for the generation of text instead of just words. I don't know if there is a true technical definition of the two, so I use the term interchangeably.

The first big hurdle with WRITE is to configure it for the Apple. A standard formatted Apple-CP/M disk holds only 126K, and WRITE comes on two disks with 142K of required files. Since the manual does not make it entirely clear how to configure WRITE for a system like Apple-CP/M, a short description is in order.

The three main files on the supplied disks are called MAKWRITE.COM, MAKWRITE.CRT and MAKWRITE.PRT. MAKWRITE.COM is the file that will "make WRITE." The files with the .CRT and .PRT extensions hold the information for the available terminal and printer configurations. Even though the supplied disks are in Apple-CP/M format, they contain the full spectrum of information on every terminal and printer for which WRITE can be configured. To start, you have to make sure that the .CRT and .PRT files are on the same disk on the B drive and that the system is logged onto the B drive. It requires a bit of shuffling to get to this point, for the files are not distributed this way on the supplied disks. In the A drive there must be a disk with MAKWRITE.COM, PIP.COM and at least 21K of free space.

At the B> prompt (remember, that is where we are logged) you type in B:MAKWRITE.COM. At this point, the program will ask you what your terminal type is (Apple-CP/M is considered a SOROQ IQ-120 or 130) and your printer type. When everything is completed you will have generated a new file of 21K length called WRITE.COM. A word processing file this small means your 126K Apple-CP/M disk can contain you operating system, utilities, word processor and even some text. Since WRITE is totally memory resident, once it is loaded, you could survive with one disk drive. WRITE minimizes disk shuffling.

Getting Started With WRITE

The design philosophy of WRITE is to minimize the writers interactions with the program. The program does not get in the way of getting your ideas written down. Movement between program modules is fast; there are no long, nerve-racking disk accesses to contend with as the program does its job.

The first thing you see when WRITE is loaded is a menu called the "Disk Block." The Disk Block is the general governing menu of the program. As its name indicates, it is the place from which all disks accesses are controlled. It is also the point from which print routines are accessed, help screens are found and volatile memory manipulated. You do not start immediately editing text with WRITE. First you make sure you are logged onto the drive you want and then

continued on page 246

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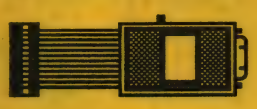

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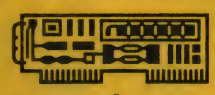

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MaxTech

Control Key Functions, Apple II WRITE

Small Cursor Movement

Control-	Home
Control-M	Same as return
Control-K	Up one line
Control-H	Left one character
Control-L	Right one character
Control-J	Down one line
Control-E	Word forward
Control-X	Previous word
Control-I	Tab
Control-Z	Move to beginning or end of line

Large Cursor Movement

Control-R	Scroll up
Control-C	Scroll down
Control-B	Beginning of text
Control-N	End of text

Insertion Command Group

Control-F	Insert mode toggle
Control-G	Insert line
Control-S	Insert formfeed marker
Control-]	Insert marker
Control-Q	Superscript marker
Control-P	Carriage return marker for search/replace
Control-A	Insert block of text

Deletion Group

Control-D	Delete character
Control-_	Delete to left (same as Delete)
Control-T	Delete to end of word
Control-Y	Delete to end of line
Control-U	Delete line
Control-O	Delete block

Miscellaneous

Control-V	Enter search/replace
Control-[	Enter disk block
Control-\	Alternate character set

Figure 1

Apple-CP/M
continued from page 245

you open and name your file if it is new, or load the file if it is old. Drives and file names follow standard CP/M conventions. Once that is done you jump into the editing screen by pushing ESC. From the editing screen you get back into the Disk Block again by pressing ESC. ESC is the key that lets you move to the different modules of the program.

If you are used to looking at the editing screen of other word processors, the free form of the WRITE screen may appear odd. Once your text goes through the formatter everything will look fine. The free form of the text screen takes a burden off the shoulders or the writer. Unlike WordStar and other word processors, you do not have to reformat your paragraphs after a search/-replace or spelling check. With other processors it is possible to have an un-reformatted paragraph that will not be discovered until the document is printed. This cannot happen using WRITE.

There is a HELP command. For the Apple, HELP is no help at all. The information given in HELP is geared to a different terminal. To assist things, I have gone through the Apple-CP/M write commands and have tabulated them into the important operational areas (Figure 1).

There are about 30 editing commands in WRITE. About half of these are ones used frequently, so the basic editing structure is fairly easy to learn. There are a few pitfalls to be aware of. On the configuration for Apple-CP/M the right arrow key erases your line; the other arrow keys works as intended. The program defaults into overwrite mode. Insert mode is easily selected from the keyboard. What I don't like is that the insert cursor totally covers the character it's on, making the insert procedure confusing. A function that does not work as advertised is the scroll speed. Supposedly the scroll speed is controllable. It does not work. I have been told that the problem is an interaction with the Apple's 80-column hardware. I have not been able to independently verify this.

If you do not like any of the standard WRITE commands, the program comes with a utility called KEYCHANGE that enables you to change the command keys around any way you prefer. The command structure is sound; give it a chance before making any changes.

Formatting and Printing

WRITE is a potent text editor, but to the writer its real advantages are its formatting and printing routines. The formatter is very powerful and with some practice and careful planning you can get your printout to look about any way that you like.

The formatter is interesting in that you can either embed formatting commands in your text, or you can change the format from the menu at the time of printing. The formatter also requires that you think a little. For example, line spacing is given in 48ths of an inch. That is, when you ask for a line spacing of 8 you get a spacing of 8/48ths of an inch, or single spacing. While not obvious, some interesting layout effects can be created with this knowledge.

As the given examples are few, the manual encourages you to experiment with the formatter. While this is good advice some more well chosen, illustrative examples would have been useful. Within the formatter there are some subtle

continued on page 248

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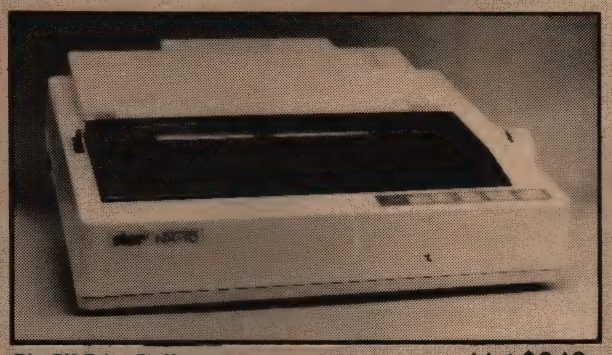

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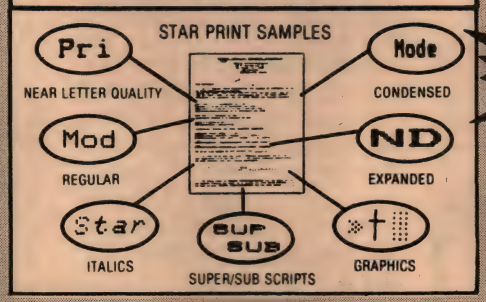

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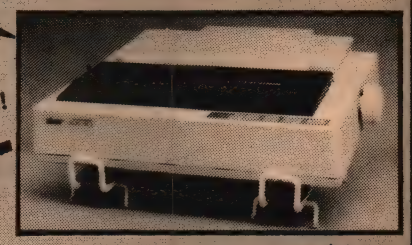

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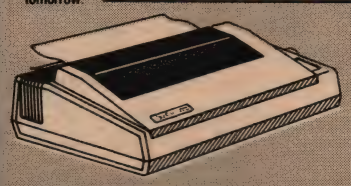

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Trailblazer—Review

Reviewed by Philip Chien

Question: How fast is fast enough? Or rephrasing it, How fast do you want your modem to operate? 300 baud was the standard modem speed way back when, but very few people are satisfied with 300 baud. It's much too slow, since it's slower than most people read, and slower than many people talk! 1200 baud has become the default standard at the present, but most users aren't really satisfied with 1200. Line errors cause glitches and drop outs, and 1200 baud won't work with many long distance communications carriers. 2400 baud is becoming available, but it hasn't gained widespread acceptance. Most networks offer 2400 baud only in major cities, and 2400 baud has many of the same problems 1200 has since it operates using the same frequencies and transmission methods.

How about 14,000 baud? Yes, that isn't a typo—14,000 baud using standard phone lines. And a better error rejection capability, phone line reliability, and carrier stability than a normal modem operating at 1200! Believe it or not, it isn't a dream sketched on some engineer's CRT—it actually exists, and actually works! Telebits' Trailblazer modem will attach to any computer with an RS-232C port, and any standard phone line through an RJ-11 jack. The secret to how the Trailblazer performs its amazing throughput is that it isn't a serial modem—it's actually a parallel 48 bit modem. Most modems use a set of four tones, one each for originate mark, originate space, answer mark, and answer space. The Trailblazer uses 48 bits at the same time, combining them as necessary to keep output high. The modem constantly checks itself over the phone line, and if one of the 48 tones used is unreliable on the connection it isn't used, and another tone replaces it. The instantaneous transmission rate is 18,000 baud, but Telebits

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Apple-CP/M continued from page 246

tricks that are a delight to use once they are discovered.

Kudos and Complaints

If you are creating text, you can do no better than WRITE. While not perfect (what is?) it is powerful, easy to learn and does what it is supposed to do. My chief complaint is with the manual. It is a compendium of the work of several authors, and while filled with information there is a problem of structure. It is in dire need of a good index. I have been told that there is a new manual in the works. While the manual has certain failings, there are parts that provide excellent information for the computing novice. Telephone support from Workman & Associates is excellent and more than make up for any shortcomings in the user manual.

ESCAPE

The ESCAPE (ESC) key is what opens the doors to the various parts of WRITE. One reader reported here some months back that he was having trouble using the old word processor "Magic Wand" with the popular Applicard because Magic Wand uses ESC and the Applicard traps ESC. A similar problem may occur in attempting to use WRITE with the Applicard (sometimes called "Starcard" when bundled with various Micropro software).

In response to the problem with Magic Wand, I received two solutions from readers. Since I don't have an Applicard, I could not try these patches out myself. The one that did not require any assembly language patches was in an unsigned letter from a reader in Louisiana. Just remember, when you play "boy hacker," always use an expendable copy of your systems software. His solution was to:

1) Re-define the ALT-mode character (try CTRL-@). This can be done from the CP/M A> prompt by pressing ESC. Then (making sure you're in 40-column mode) press CTRL-E then CTRL-@ (or whatever the alternative mode character you selected is). Then press CTRL-X to return to CP/M. Henceforth, ALT-mode is selected by the new character and ESC is not recognized.

2) To permanently re-define the ALT-mode character, run the program "CONFIGSV" supplied with the Applicard, make the same change, then install SFTVIDEO as driver #1 using the install program as described in the Applicard's owners manual.

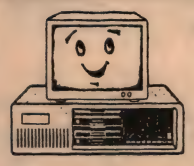
I would appreciate any reports on how this fix works out.

Apple MSDOS Update

It was mentioned here several months ago that an outfit called The Engineering Department (271 East Hacienda Ave., Campbell, CA 95008) was developing an IMB-PC compatible card for Apple II series machines. The latest story is that their card will be marketed through Applied Engineering (P.O. Box 798, Carollton, TX 75006, (214) 241-6060). If this is true, it is a very smart move on the part of The Engineering Department. AE is one of the most well known and aggressive developers and marketers of peripherals for the Apple.

It has also been recently reported that Orange Micro Inc. (1400 N. Lakeview Ave., Anaheim, CA 92807) has announced a product called DOS Boot that will enable MSDOS to be booted from an external disk drive. It is not known at this time how much PC compatibility there will be. The report I read says DOS Boot will work only with the IIgs. ●

Data Dynamics



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Trailblazer continued from page 248

quotes "only" 14,000 to allow for less than perfect lines, and checksum information. Since the modem constantly checks itself it is very immune to line noise, background hums, and other phone annoyances. It takes a lot of computing power to constantly check 48 different tones, and the Trailblazer has a lot of computing power. The modem uses a Motorola 68000 microprocessor, and a TI TMS 320 signal processor—much more computing power than many computers it's attached to.

Since the Trailblazer has dozens of different modes available, it is compatible with almost any modem in existence. In the 300 baud mode the Trailblazer uses FSK encoding for Bell 103 standard communications, at 1200 baud the DPSK standard is used for Bell 212, and in the high speed modes a special DAMQAM (Dynamically Adaptive Multicarrier Quadrature Amplitude Modulation) method is used. What it all boils down to is the Trailblazer, with a set of properly programmed internal ROMs can operate as any modem needed. The early versions of the Trailblazer were not compatible with the 2400 baud and V.22 standards, but once the software was programmed, existing modems could be upgraded with a $99 kit consisting of four replacement ROMs.

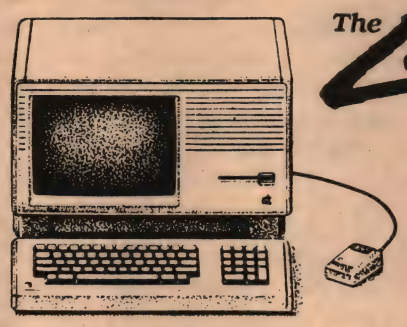
The Trailblazer operates adequately with standard modem software, since it's software compatible with the DC Hayes Smartmodems. The Trailblazer will respond to standard Hayes "AT" commands, but it is not totally software compatible with Hayes modems. The bit mapped memory registers aren't the same, and the modem may respond with a different number of carriage returns after a command. On the other hand, the Trailblazer has 101 S registers—including several which show the quality of the phone line. Although it operates with standard programs, they won't use the Trailblazer modem to its fullest capabilities. For example, almost all communications programs use the popular X-modem standard (Christensen protocol, Modem7, and a variety of other names) for file and program transfers. X-modem is fine for slow speeds local transfers, but very inefficient when used with the Trailblazer. X-modem sends files in sets of 132 byte packets, with a one byte return acknowledge character. The sender must wait for each acknowledge byte before sending the next packet. Trailblazer is optomized for much larger packets, and works best when it is sending very large (10K) packets of data. Early Trailblazers could not even handle high speed interactive communications, but the latest models are interactive at all speeds, making very flexible and powerful transfer programs possible.

Two Trailblazer modems are available, an IBM PC internal version, and an external stand-alone model. The stand-alone includes a variety of extras. Besides 8 indicator LEDs (FAST, SLOW, ON HOOK, READ, SEND, CTS, DTR, MODEM READY) it has a fan, built-in speaker (with a software adjustable volume level!), and an EEPROM (Electrically Eraseable Programmable Read Only Memory) which stores your operating parameters and a phone list. The memory in the modem will keep track of ten phone numbers and names, which can be stored in the non-volatile EEPROM.

Both models are very flexible. If you call a Telebits modem from a remote location it will automatically search through the various speeds, first the fast mode, then 2400, 1200, and finally 300 baud to determine what speed your calling modem is set at. When dialing out you can choose to dial a number from the phone list, or enter a number directly. Among other features if you have to dial through a PBX system or a long distance network, the Trailblazer will wait for secondary dial tones, if you are using a direct connect

continued on page 253

When you're ready to mouse around...



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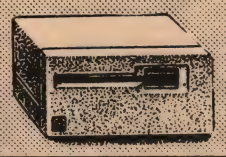

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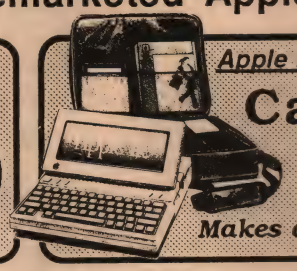

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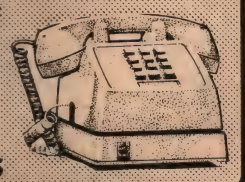

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Renting Software—Boon or Bane?

by Randy Holcomb

Well, it looks as if we're about to shoot ourselves again, and we only have ourselves to blame. What, you ask, am I flaming about now? It's called Software Rentals and the very real negative effect it can have on software developers, computer store owners and the consumer.

I'm sure that at one time or another someone has touted software rental as a way of helping the consumer select the software that they need and within the same breath another voice cries out that rentals will only promote rampant piracy. Both sides are right, and herein lies the problem: how do you keep both sides happy without causing another wave of new copy-protection schemes that will be busted in a short time? It's a vicious cycle; and unless YOU are aware as to what is going on out in computerdom YOU could fall victim to questionable practices, or worse yet, lose money.

The theory behind software renting has been around for a while as a result of the home computer wars of the early 1980s when it seemed almost everyone was selling computers and software. At the time prices were falling like mad on both hardware and software, but unless you knew what program(s) you needed you would be damn lucky to find a place where you could demo the program "hands-on" so you can see if the software would do what you wanted it to do (this problem still exists today). We all have our horror stories of buying a program with pretty packaging only to find out it was pure garbage. (There's a Murphyism that says "90% of everything is crud"—amazing how well it applies to software.) So the idea of "renting" software was born.

How "Renting" Software Works

Let's say that you own a computer (doesn't matter what kind; most rental places stock software for IBMs, C64/128s, Apple II, and the Macintosh, Amiga, and Atari ST and you want to rent a particular title. Normally, you would pay a "membership" fee to join the rental club (or if you bought your computer from the outfit they will typically waive the membership fee) at which point you can now go and rent a program. Most rental places will limit you to a certain number of titles that you can take out at one time. As for the charges, most places require that you leave a deposit for the full amount of the software in the form of cash, check or charge, and then the actual rental charge is based on a percentage of the price of a program, typically being between 15-30%, with 25% being the norm. Once you have paid up front you are given about a weeks time to use the software and then determine if you want to purchase the software. Should you decide to purchase the software, the store will typically give a discount of the rental price paid, and all you have to do is to make up the difference. For example, let's say that you want to rent a $200 spreadsheet program. You would leave a $200 deposit up front, then pay a 25% rental fee for one week, which comes out to $50. You now have the program to play with for one week. After the week is up you can either buy the program or just return it. If you choose to buy the program the $50 rental goes against the purchase price of the software, so if the store marks the software down 25% you would pay $100 to make up the difference. Naturally, all monies on deposit would be returned or in the case of credit cards the slips would be torn up. So everything is on the up-and-up, you like the program, you purchased it and all is well.

Now let's look at the other side of the coin and you decide that the program isn't up to snuff. You return the program and get your deposit back. You now have spent $50 and found out that the program is a dog. You are out your $50 and you have nothing to show for it! Some deal, right? You probably feel a little low right now, but you say to yourself "Boy am I glad I didn't buy the turkey!" That's not going to bring that $50 back. Keeping in mind that "90% of everything is crud" you could spend a small fortune renting software trying to find the right combination of software to meet your needs. But no one is holding a gun to your head forcing you to rent the stuff either! That's why there's people and magazines like *Computer Shopper* that tell it like it is in product reviews, much like a movie reviewer would do. Surprisingly there is little difference behind the mechanics of software rental versus renting a movie cassette: both are forms of software. Where it gets different is in the price and its potential for abuse. In the case of computer software, the abuses are much more subtle, more deceptive, and ethically questionable; if not legally.

Piracy

Of all the abuses this is by far the worst offense of them all. Jokes are bantered around about how a person will join a rental club, rent several titles, buy a box of diskettes and buy (or even more absurd, rent!) a disk copying program. With a story like that you can imagine what this person is up to. No sermon here on piracy, just pointing out one of the abuses of software renting. The dealer really can't do anything about it because once the program leaves his store he's lost control over what the individual does to it (of course if the renter trashes the software they're stuck with it). It's up to the individual who rents the software not to copy it.

Dealer Abuse

If your dealer is reputable and on the up-and-up they will keep a separate inventory on what they rent and what they sell. There are cases, however, where a piece of software pulled for rental returns back to the sales shelves and is sold as if it were a new item. Of course, this is fraud-selling used merchandise as new. But how can you tell? Most software manufacturers don't

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Analog Clock

by Philip Chien

What? You thought my Binary clock program in the December 1986 issue of *Computer Shopper* was too difficult to read? You thought my "Digital Talking Clock" program in the January issue was too easy to read?

Well, here's a traditional old-fashioned two hand clock, with a sweeping second hand. In HIRES graphics of course.

Analog Clock is written in Applesoft, and it will operate on an Apple II Plus, Apple IIe, or IIc with an appropriate clock. It is designed for use with a ProClock, or any standard ProDOS clock which plugs into a slot, and IIc System Clock owners—read on! This article includes information on how to modify all three programs to work with your clock.

Analog Clock plots traditional hour and minute hands on the Apple's HIRES screen (Diagram #1). The seconds hand is plotted in color, and each minute the color is changed. Each hour the screen clears itself, and the clock continues running. The program (Diagram #2) is fairly straight-

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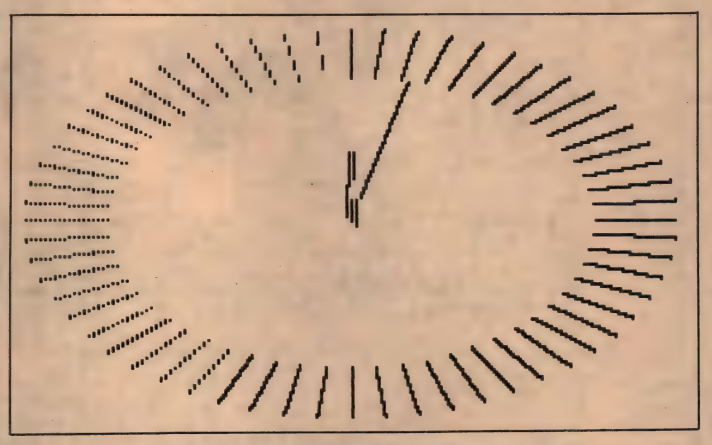

Diagram #1: Analog clock displaying 12:03:32

Diagram #2: Program

```
99    GOTO 10000
100   REM READ CLOCK
110   PRINT D$;"IN#";CS:
        PRINT D$;"PR#";CS
120   INPUT "%";CL$
130   INPUT "#";MO,DW,DT,HR,MN,SE
140   PRINT D$;"IN#0":
        PRINT D$;"PR#0"
150   VTAB 22: POKE 36,9: PRINT CL$
160   RETURN
170   REM ----------------------
200   REM Polar Plot routine
210   X1 =  SIN (T) * Z1 * K1:
        Y1 =  SIN (P2 / 4 - T) * Z1
220   X2 =  SIN (T) * Z2 * K1:
        Y2 =  SIN (P2 / 4 - T) * Z2
230   HPLOT 140 + X1,80 - Y1 TO
        140 + X2,80 - Y2
240   RETURN
1000  GOSUB 110
1010  REM ==== new hour =====
1020  HGR : REM Clear screen each hour
1030  T = P2 * HR / 12:Z1 = 0:Z2 = 30
1040  HCOLOR= 3: GOSUB 210
1050  REM Plot large hour hand
1060  HPLOT 142,82 TO 140 + X2,80 - Y2:
        HPLOT 138,78 TO 140 + X2,80 - Y2
1070  REM ==== new minute ====
1080  T = P2 * MN / 60:Z1 = 10:Z2 = 60
1090  HCOLOR= 3: GOSUB 210
1100  REM ==== new second ====
1110  REM Change sec color each min
1120  C = C + 1: IF C = 3 THEN C = 5
1130  IF C = 7 THEN C = 1
1140  T = P2 * SE / 60:Z1 = 60:Z2 = 80
1150  K0 = K1:K1 = 1.7: HCOLOR= C:
        GOSUB 210:K1 = K0
1160  S = SE:M = MN:H = HR:
        REM Save old time
1170  GOSUB 110
1180  IF S = SE THEN 1170
1190  IF M = MN THEN 1140
1200  HCOLOR= 0:T = P2 * M / 60:
        Z1 = 10:Z2 = 60: GOSUB 210:
        REM Erase old minute
1210  IF H = HR THEN 1080
1220  GOTO 1020
1230  END
10000  LOMEM: 16384

10020  K1 = 1.3: REM Circle konstant
10030  P2 =  ATN (1) * 8: REM  2 * PI
10040  TEXT : CALL  - 936
20170  REM SEARCH FOR CLOCK
20180  FOR CS = 7 TO 1 STEP  - 1
20190  IF  PEEK (49152 + CS * 256 + 5)
       = 255 AND  PEEK (49152 + CS *
       256 + 7) = 5 THEN 20230
20200  REM $Cn05 = $FF  $Cn07 = $05
20210  NEXT CS
20220  PRINT "No clock found!": END
20230  REM CLOCK HAS BEEN FOUND
20240  GOTO 1000
32000  REM Analog clock
32010  REM Last mod 1-29-87 7:15pm

32020  REM (c) 1987 by Philip Chien
```

Analog Clock continued from page 252

forward, and can be typed into either DOS 3.3 or Applesoft.

Normally Applesoft plots cartesian (X,Y) coordinates, but the subroutine starting with line 200 converts them into polar coordinates to create a circular clock. Since the Apple's screen coordinates aren't perfectly square, a linearity constant (K1) is used to make a better looking circle. K0 is used to make the seconds into an oval for a more modern looking clock. P2 equals two pi (the arctangent of 1 is pi/4), and used in many of the circle calculations. Z1 and Z2 are used to determine the starting and ending length of any of the clock's hands. Z1 is the start, and Z2 is the end. T determines the angle of the hand and ranges from 0 to 2 PI. The size of the angle (in radians) is converted into the arm by the polar routine. C is the color of the seconds pointer. Lines 1120 and 1130 change the color, and make sure that it isn't changed to black or white.

You can either type in the clock program directly, or download it from the Earth News Central BBS (718-934-0774). The program is located in General file #6. In addition, Earth News is providing all three clock programs on a diskette for $10 (New York residents please add sales tax). Send check or money order payable to Earth News to: Earth News, 3094 Coney Island Ave., Brooklyn, NY 11235, Attn: *Computer Shopper* programs. No extra support is provided by Earth News, only the three programs on a diskette.

Special note to owners of the Applied Engineering IIc System Clock: Diagram #3 includes the modifications to make the clock read routine work with the IIc System Clock. Since the System Clock attaches to the IIc's serial port you have to load in a driver program, and whenever you want the time, you have to access the clock through a CALL function. Type in any of the three clock programs (Binary Clock, Digital Talking Clock, or Analog Clock) and then put in the modifications. Make sure you transfer a copy of the file "AE.BT" from your IIc System Clock utilities disk onto the same disk as the clock program. ●

Diagram #3: Modifications for the IIc System Clock

```
Delete lines 20180 - 20220 and lines 110 - 139

Add the following lines:

20180 PRINT D$;"-AE.BT"
  110 CALL 970, CL$
  120 MO = VAL(MID$(CL$, 3,2)): DT = VAL(MID$(CL$, 6,2))
  130 HR = VAL(MID$(CL$,12,2)): MN = VAL(MID$(CL$,15,2))
  135 SE = VAL(MID$(CL$,18,2)): DW = VAL(MID$(CL$, 1,1))

Check your changes, and save the revised copy to your disk.  Don't
forget that you must have a copy of "AE.BT" on the same disk.
```

Trailblazer continued from page 249

phone line the Trailblazer will automatically attempt connections without waiting for a ring signal, and the modem has a sophisticated built-in auto-diagnostic program.

Many standard 1200 baud modems will communicate with their computers constantly at 1200 baud, whether the modem is operating at 300 or 1200 baud. Other modems will set the connection speed to the computer at the same rate as it communicates with the phone line. With the Trailblazer you have a choice. You can select a variety of baud rates, or tell the modem to communicate with the computer at the same rate it transmits. Since the modem automatically adapts to the phone line as necessary, the selectable speeds make it much easier to connect it to a computer at a constant baud rate if necessary.

Naturally you will have to pay extra for the extra performance. The IBM PC compatible version of the Trailblazer retails for $1995, and the stand-alone RS-232 version retails for $2395. Actually the real cost is twice as expensive—one Trailblazer by itself is useless, you have to have two to tango! In addition, most modem programs aren't optomized to use the Trailblazer's special capabilities. Besides the X-modem problems mentioned earlier most communications packages aren't designed to send entire disks, paths of hard drives, or sets of programs in one session. Special versions of ASCII Express Professional (AE Pro) and Crosstalk are available separately, and highly recommended if you want to use the Trailblazer to the fullest of its capabilities. If you get a Trailblazer you can however junk your present modem, since the Trailblazer also operates as a 300, 1200, and 2400 baud modem, and will work with standard Hayes compatible software.

Is the Trailblazer cost effective? A 360K diskette (about 100 pages of text) can be transferred in 4 minutes by the Trailblazer, as opposed to 60 minutes by a normal 1200 baud modem, and overnight by an express mail service. If you transmit large amounts of information through long distance phone lines on a regular basis, the Trailblazer will actually pay for itself! If speed is the most important thing, and you transfer data often between two locations, the Trailblazer may be worth it. Hopefully the Trailblazer high speed packet techniques will become more popular, and a future communciations standard. If a long distance communications network (Telenet, Tymnet, etc.) and a large database (Compuserve, GEnie, Delphi) supports the

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Copy II Plus

Reviewed by Philip Chien

The biggest annoyance most users have with ProDOS is Apple's FILER and SYSTEM UTILITIES programs. They are, to put it mildly, a pain to use, and very confusing, especially for a beginning user, but even for advanced users. Terms like sub-directory, path, and volume are easy to learn, but using them becomes a task, and makes ProDOS much harder to use.

Copy II Plus solves these problems with a set of easy to use copyable utilities which are in many ways more powerful than Apple's programs. The program consists of two separate utilities, the UTIL. SYSTEM file utility, and the BIT.SYSTEM bit copier.

The UTIL.SYSTEM is written in ProDOS, and will work with all standard ProDOS file devices (hard drives, floppies, RAMdrives, etc.) in addition it also supports DOS 3.3 on 5¼" floppies, and will transfer files to and from DOS 3.3. Earlier versions had a bug when writing directories to hard drives which could potentially crash data, and would not properly save the names of Appleworks files, but the latest releases correct those bugs. Several functions have been removed though. DOS 3.2 support has been dropped in the present version. It's not much of a loss, after all DOS 3.2 hasn't been in use since 1980, but if you have a large collection of old DOS 3.2 13 sector disks, you may want to scrounge up an old copy of Copy II Plus or Apple Computer's MUFFIN program to transfer all of your old files in 16 sector disks. In addition, minor functions like fix file lengths and compare files have been deleted for memory reasons.

When you boot Copy II Plus it will check if you have a clock installed in your system. If it finds a clock it will automatically time and date stamp your files. If not, it will ask you to enter the date, and it will date stamp files. The program will then ask you if you want a 40 or 30 column display for catalogs. Most of the time you will want 80 column displays, but it's nice to have the choice, in case you want a 40 column display to make it more readable.

If you are using an Apple IIgs, I highly recommend that you upgrade the ProDOS on the diskette from ProDOS version 1.1.1 to ProDOS 3 version 1.2. ProDOS 1.1.1 will not recognize the clock in the IIgs, and in addition it doesn't support interrupts. Since the Copy II Plus diskette is totally full, and contains no free sectors, you will have to delete the empty sub-directory files to make enough space. Make sure you do this on a backup copy of Copy II Plus—not the original! If you have two 5¼" floppies, the easiest way to do this is to use Copy II Plus to create a IIgs version of itself. Table #1 shows the proper steps to make a IIgs compatible copy.

As I stated earlier, Copy II

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How To Make A IIgs A Compatible Copy of Copy II Plus

This assmes you have a IIgs with a 3.5" drive attached to the smartport, and two 5¼" floppies daisychained.

Put your IIgs system utilities into the 3.5" drive (slot 5, drive 1), the Copy II Plus diskette into your first 5¼" drive (slot 6, drive 1), and a blank floppy into the other 5¼" drive (slot 6, drive 2).

Turn on your IIgs, and your Copy II Plus diskette will be booted, placing you into the utilities menu.

Format the blank floppy in slot 6 drive 2 for ProDOS, and give it the name "C." This is a temporary name, and a safety measure to make sure you don't write on the wrong diskette.

Select COPY, FILES, and copy from slot 5 drive 1 to slot 6 drive 2. Select the sub-directory SYSTEM from the IIgs utilities diskette, and transfer the file "P8" to the floppy you just formatted.

Select RENAME FILE from slot 6 drive 2. The only file there should be "P8", the file you just transferred. Rename it to "PRODOS." (This is the new ProDOS 8 1.2.)

Select COPY, FILES, and copy from slot 6 drive 1 to slot 6 drive 2. Select the main directory (COPY II PLUS), and copy over the file UTIL.SYSTEM. If you also want the bit copy program copy over the files BIT.SYSTEM, PARM.KEY, and PARM.DATA. In either case ignore the sub-directories, they are empty and just there to show how the Copy II Plus directory tree works.

Select RENAME VOLUME from slot 6 drive 2, and rename it from "C" to "COPY II PLUS."

Remove the original Copy II Plus diskette from slot 6 drive 1, and put it away in a safe place.

Put a blank diskette into slot 6 drive 1, and select COPY DISK from slot 6 drive 2 to slot 6 drive 1 to make an extra backup copy.

When you are finished, you should have two copies of Copy II Plus, with the ProDOS 1.2 operating systems. Label both copies, save one in a safe place as a backup, and use the other disk as your working copy.

Trailblazer
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Trailblazer, 300 baud, 1200 baud, and even 2400 baud communications will be as slow in the future as a teletype is today.

Product: Trailblazer modem

Distributor: Telebit Corporation, 10440 Bubb Road, Cupertino, CA 95014; (408) 996-8000.

Retail price: $1995 for IBM PC compatible, $2395 standalone.

Hardware requirements: PC version IBM PC or compatible: model RA12C long slot, standalone: model RA12E any computer with an RS-232C interface.

Warranty: 1 year

Summary: The fastest modem available for standard phone line use, but worthless unless you have two. ●

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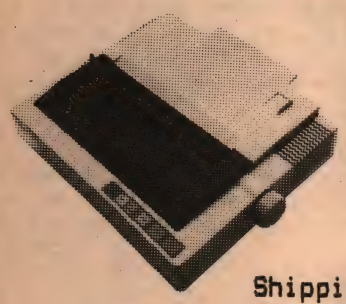

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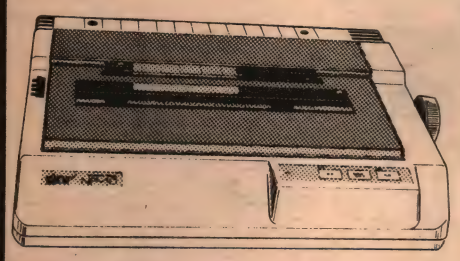

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Copy II Plus continued from page 254

Plus will work with any standard ProDOS file device, including RAMdisks. That's mostly true. Copy II Plus will work with a RAMdisk in a slot (IIgs RAMcards, Apple Memory expansion card, RAMfactor, etc.) without any problems. However, AUX slot RAMcards (RAMworks, Z-RAM, etc.) will only be useable to 64K, unless you setup the RAMdisk ahead of time. If you are using an AUX slot RAMcard, and want to use it with Copy II Plus, you should run your RAMdisk program first, and then run Copy II Plus.

There are several ways where Copy II Plus is much more powerful than the Apple utilities which it replaces. Its menu is well organized, and it's easy to select functions, and sub-functions. The program has a very efficient single drive copy program, which will copy a 143K 5¼" floppy in two passes on a 128K Apple IIe, IIc, or IIgs. If you have an older 64K Apple II Plus, or compatible unit it will take 12 passes, but it is still faster than Apple's utilities. RAMdisks don't make the copy any faster, and copying an 800K microfloppy on a single drive takes too many passes, but I found a solution. First copy the disk you want to copy onto your RAMdisk. Copy II Plus has a special function which lets you copy a smaller device (your floppy) onto a larger device (your RAMdrive). It will save the entire floppy disk as an image file on your RAMdisk. The image file can't be run, or modified, but it can be copied back down onto formatted floppies. With a RAMdisk with at least 800K you can copy a 3.5" floppy in just one pass in less than two minutes.

Selecting sub-directories in Apple's FILER and SYSTEM UTILITIES is a pain, and selecting folders (same thing) through the new DESKTOP FILER (imitation Macintosh filer) on the IIgs is rather slow. But with Copy II Plus sub-directories are very easy to modify and access. All you have to do is use the arrow keys ("A" and "Z" for up and down on an Apple II Plus) to move your cursor on the screen until the sub-directory you want is highlighted. If the tree for your hard drive is too large to fit on the screen it will scroll with your cursor movements. Another function makes sub-directories much easier to use, full sub-directory functions. Whenever you delete or copy a sub-directory, the entire contents of the sub-directory are affected. If you copy a sub-directory from one diskette to another, the name of the sub-directory—and the contents are copied, not just the name.

Selecting files for action is rather flexible and versatile. You can select files in the order you want with a toggle function, you can use a wildcard function, and you can even select by file types. For example, you can select all of the Appleworks word processor files and database files which start with the letter "A." The type select lets you select any standard ProDOS file type (BAS, BIN, TXT, VAR, AWP, ADB, ASP, SYS, DIR, etc. in ProDOS and B, A, I, T in DOS) but it will not recognize user defined data types or hex data types (e.g. $F5 in ProDOS and R or S in DOS).

In addition to the standard file utilities Copy II Plus includes an alphabetize catalog function, and a disk speed verifier utility. The disk speed program will only work with 5¼" diskettes, and unlike other disk speed verifiers which show the speed in RPM, the Copy II Plus program displays milliseconds per revolution. Apple drives normally operate at 300 RPM, which translates to 200 milliseconds per revolution. Revolution speed is fairly easy to get used to, once you realize that higher numbers mean slower speeds.

Copy II Plus does have several built-in limitations. If you are using any double DOS diskettes (i.e. a disk which can boot into both ProDOS and DOS 3.3) only the ProDOS portion is recognized by Copy

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Copy II Plus
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II Plus, you cannot access the files in the DOS 3.3 section. Due to memory limitations you can only access the first 255 items in any directory. 255 directory items should be enough for the present, but may not be enough for the future since the latest versions of ProDOS can access over 8 gigabytes(!) of memory.

There is a major "feature" in the Copy II Plus manual which every owner should be aware of. "Floppy" refers only to standard 5¼" floppies, not the 3.5" microfloppies. Many functions in the program are limited to use with the floppies (5¼") only, and will not work with the 3.5" Unidisks, or other drives. These include the disk speed checker, disk map, all DOS 3.3 functions, and the bit copier. Yes, DOS 3.3 is not technically supported on 3.5" diskettes, however there are at least three different second party programs which make DOS 3.3 compatible with the microfloppy, and it's regretable that Copy II Plus doesn't support any of them.

The bit copier in Copy II Plus will copy many, although by no means all, 5¼" copy-protected diskettes. It is a fairly standard bit copier, with one very special extra. The parameters which teach Copy II Plus how to copy each program are saved on the program diskette. When you attempt to backup a specific program, all you have to do is select AUTO COPY, and type in the name of the program. The parameters for the program will be loaded, and used for your backup. If you are the adventurous type who wants to figure out your own parameters, you can edit and save your own parameter file to the Copy II Plus diskette.

For those with the proper knowledge and curiosity several chapters in the Copy II Plus manual discuss how bit copiers and copy-protection methods work, and how to set the parameters in the program. Several utilities are included which make it easier for an experienced programmer to make a backup copy. The bit copier comes with a HIRES disk scanner, sector editor, patcher, and nibble editor. If you know enough information about how a disk is organized, the utilities may be able to tell you enough information to create your own parameters for programs which aren't supported by Central Point Software.

Copy II Plus will not copy everything. Contrary to what Central Point Software, and many users think, there are many programs which just cannot be copied by an unmodified Apple drive, no matter how well made a bit-copier program is designed. In addition, although the Copy II Plus parameter list includes hundreds of programs, there are still thousands of other programs which aren't listed, and are not copyable without a lot of extra work on the part of the person who is attempting to make a backup copy.

The Copy II Plus parameter files are partially provided through user donations, and partially by Central Point Software. According to the company it releases updates every three months to the parameter files, and registered users can update their copies of Copy II Plus for $5.

I found the utility program the best part of Copy II Plus. It has totally replaced FILER and CONVERT for all of my ProDOS applications, and I have a copy of it on each of my ProDOS utility diskettes. The Bit copy program I found much less useful. Almost all decent software manufacturers have eliminated copy-protection, and have acknowledged that it's just not worth the headaches anymore. ●

Renting Software
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bother to use special shrink-wrap to ensure that the product has been tampered with from the outside (although some manufacturers do place diskettes in sealed envelopes or have protection tabs covering the disks which must be broken prior to use). Your best course of action is to yell at the dealer and have them order you the latest version of the software; if that doesn't get a response then call up your local Attory General in your state.

This abuse by a dealer is pure gravy: not only has he made money on the number of times it has gone out the door via renting but during the sale the dealer squeezes more money out of the time.

What Do You Do?

This article was not meant to be a slam against the software rental promoters, for I do think that the service they provide is a valuable one, but rather to inform the public that abuses are present, and to give some guidelines as to dealing with renting software. At the same time I'd like to throw in some ideas to both the dealers and software manufacturer whose products are rented.

To The Renter

(1) Know your dealer. Talk to other people who have done business with them. (2) Know WHAT you want to rent with the INTENTION that you will probably want to buy the package. Don't indiscriminately rent software you won't buy. Read review articles and check around with the major information services, BBSs and your users groups. (3) If you decide to purchase a program that you rented, make sure it's the real article and hasn't been previously rented. Check for the registration cards, documentation, disks and version of the code, or have the dealer order the latest version.

To The Dealer

(1) Selling rental software as new is a sure-fire way of getting a bad reputation, and is bad business. If you sell your rental software, sell it as used and price it fairly. It will sell itself. (2) Keep separate rental and for sale stocks, and periodically sell off the old rental stock and update it with the latest versions. Allow customers the opportunity to at least get a taste of the software before letting them rent it (telling a customer to "rent it and find out" will turn most people off real quick).

Software Publishers

To the "90%" bunch: you're history. It won't take long to isolate who belongs to the 90% and to the 10% crowd. For those of you in the "decent 10%": (1) Listen to your customers when they write you nasty grams and comments. Failure to do so will cause you to lose a customer. (2) Provide special "Rental Only" to dealers for a nominal fee with all the copy-protection you want. Remember, you want to SELL your code, so be responsive to the dealer if they put the code up for rental. (3) Price the code fairly. It's refreshing to see some good-quality programs at reasonable prices but there's still a long way to go: studios spend millions on a movie that sells for under $100, and in increasing numbers under $30. There's a lesson to be learned there. ●

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Applying The Atari continued from page 115

120) without erasing the subroutine. When you RUN this short program, it will initiate the Automatic Voice Silencer and will then sound four notes simultaneously. Lines 70 through 100 of this program give each voice a different duration from two seconds to eight seconds. After the program ends, it will print "LISTEN..." and you should be able to hear each voice being turned off one after the other. Note that the demo program itself does not shut off the voices, but merely specifies the duration.

By adding specified time durations to independent sound generation, the Automatic Voice Silencer creates a more versatile sound function. Use it to free up the time between generating a sound and turning it off so you can use the Atari's sound registers as they were designed to be used.

Coming Up

For those of you who can't get enough heavy typing to do, a bank account recordkeeping and checkwriting program is in the works. Stay tuned...

Readers' questions, comments and contributions are welcome. Please enclose a self-addressed, stamped envelope (SASE) for a personal reply. Due to volume of letters received; only a selected number of personal responses can be given each month.

A diskette containing the programs listed in this month's column is available from the author for $7, postpaid. Please make your check payable to "Jeff Brenner" and specify your disk drive model.

"Program Perfect" is a utility used to check for typing errors while entering programs from this column. Readers can send $5 for a diskette or a SASE for a listing of this program.

Address all correspondence to Jeff Brenner, "Applying The Atari 4/87" c/o *Computer Shopper*, P.O. Box F, Titusville, FL 32781-9990. ●

PROGRAM PERFECT CODER

```
MUE 10 DIM D$(100),NAME$(100):D$="D:":PRINT "NAME OF FILE: ";:INPUT #16;NAME$
KME 15 INPUT #16;NAME$:D$(LEN(D$)+1)=NAME$
BSJ 20 PRINT "PRESS SPACE BAR FOR PAGE BREAK"
WAJ 30 OPEN #1,4,0,D$:T=0:INPUT #1,D$
ORJ 40 IF D$(LEN(D$))=" " THEN D$=D$(1,LEN(D$)-1)
FUJ 50 TRAP 60:INPUT #1,NAME$:NL=VAL(NAME$)-VAL(D$):GOTO 70
BYJ 60 NL=26:E=1
AOJ 70 T=NL:FOR I=1 TO LEN(D$):T=T+ASC(D$(I,I)):IF T>650 THEN T=T-650
BHJ 80 NEXT I:C1=INT(T/26):C2=T-C1*26
FSJ 90 PRINT #3;CHR$(C1+65);CHR$(C2+65);CHR$(64+NL);
IHJ 100 PRINT #3;D$
SGJ 110 IF E=1 THEN END
HGJ 120 D$=NAME$:IF PEEK(764)<>33 THEN 40
SZJ 130 POKE 764,255:PRINT "PRESS RETURN WHEN READY"
NAJ 140 IF PEEK(764)<>12 THEN 140
ADZ 150 GOTO 40
```

PROGRAM PERFECT CODER 2

```
KAE 10 OPEN #3,8,0,"P:":DIM E$(1):E$=CHR$(27)
QHE 15 PRINT #3:PRINT #3:PRINT #3:PRINT #3
BJJ 20 PRINT #3;E$;"@";E$;"4";E$;"E";E$;"N";CHR$(10);
MXE 30 DIM N$(40):PRINT "TITLE";:INPUT N$
UDE 35 PRINT #3;E$;"W";CHR$(1);E$;"4"
IVJ 40 FOR I=1 TO (40-LEN(N$))/2:PRINT #3;" ";:NEXT I
BWJ 50 PRINT #3;N$;E$;"W";CHR$(0);E$;"5"
WKJ 60 PRINT #3:PRINT #3
YHJ 70 DIM D$(100),NAME$(100):D$="D:":PRINT "NAME OF FILE: ";
RXJ 80 INPUT #16;NAME$:D$(LEN(D$)+1)=NAME$:PRINT #3;E$;"A";CHR$(14);
WGJ 90 OPEN #1,4,0,D$:T=0:INPUT #1,D$
SKJ 100 IF D$(LEN(D$))=" " THEN D$=D$(1,LEN(D$)-1)
KZJ 110 TRAP 120:INPUT #1,NAME$:NL=VAL(NAME$)-VAL(D$):GOTO 130
DRJ 120 NL=26:E=1
CHJ 130 T=NL:FOR I=1 TO LEN(D$):T=T+ASC(D$(I,I)):IF T>650 THEN T=T-650
QAE 140 NEXT I:PRINT #3;E$;"F";:C1=INT(T/26):C2=T-C1*26
VGE 145 PRINT #3;CHR$(C1+65);CHR$(C2+65);CHR$(64+NL);E$;"E";
DLJ 150 PRINT #3;" ";E$;"E";D$
SLJ 160 IF E=1 THEN END
JEJ 170 D$=NAME$:IF PEEK(764)<>33 THEN 100
TEJ 180 POKE 764,255:PRINT "PRESS RETURN WHEN READY"
NKJ 190 IF PEEK(764)<>12 THEN 190
BSZ 200 GOTO 100
```

AUTOMATIC VOICE SILENCER

```
LWJ 20000 REM AUTOMATIC VOICE SILENCER
KLJ 20010 REM BY JEFF BRENNER
DEJ 20020 REM COMPUTER SHOPPER, 4/87
LTJ 20030 T=0:I=0:RESTORE 20140
BGJ 20040 READ N
APJ 20050 IF N=-1 THEN 20090
QEJ 20060 POKE 1536+I,N
QTJ 20070 I=I+1:T=T+I+1
IZJ 20080 GOTO 20040
EYJ 20090 IF T=1325 THEN 20120
PUJ 20100 PRINT "ERROR - CHECK DATA LINES"
XOJ 20110 STOP
LXJ 20120 I=USR(1536)
EOJ 20130 RETURN
OXJ 20140 DATA 104,162,6,160,11,169,7
TDJ 20150 DATA 32,92,228,96,230,203,165
OSJ 20160 DATA 203,201,6,208,23,169,0
QRJ 20170 DATA 133,203,160,6,162,3,181
UKJ 20180 DATA 204,240,6,214,204,181,204
SUJ 20190 DATA 240,8,136,136,202,16,241
QZJ 20200 DATA 76,98,228,153,1,210,240
JYZ 20210 DATA 243,-1
```

VOICE SILENCER DEMONSTRATION

```
AQJ 10 REM DEMONSTRATION PROGRAM
FSJ 20 GOSUB 20000
PHJ 30 SOUND 0,121,10,8
POJ 40 SOUND 1,162,10,8
PUJ 50 SOUND 2,193,10,8
PRJ 60 SOUND 3,242,10,8
XBJ 70 POKE 204,20:REM TWO SECONDS
ATJ 80 POKE 205,40:REM FOUR SECONDS
XDJ 90 POKE 206,60:REM SIX SECONDS
EPJ 100 POKE 207,80:REM EIGHT SECONDS
XWJ 110 POKE 203,0:PRINT "LISTEN..."
ULZ 120 STOP
```


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Hacking The ST

continued from page 120

for fetching the value from the array. With address register indirect with post-increment addressing, the CPU automatically adds 2 to the contents of register a0 after it has performed the move.

By using the post-increment mode, we have managed to eliminate another instruction from our loop, speeding up our search even more. As you can see, the addressing mode used affects the efficiency of your code quite a bit.

I hope this short series of examples has shown you the importance of knowing the addressing modes that your CPU has. Knowing all the addressing modes your CPU uses can help you generate the most efficient code possible, while forgetting, or not knowing an addressing mode exists, can cause you to use very poor code to get a job done.

(For the people still reading that know 68000 assembly language well, there are branching instructions that allow us to do the search in only a couple of instructions, but I don't want to muddy the waters now with new instructions.)

The time has come to cover the addressing modes used by the 68000 CPU. The first addressing mode we'll cover is data register direct. In data register direct addressing, your data is contained in one of the 68000's data registers. In the cmp.w # – 1,d0 instruction, we let the CPU know that one of the values being compared is in register d0. This is data register direct addressing.

The next addressing mode is address register direct. The externally visible difference between data register direct and address register direct is whether you use an address register or a data register. There are some differences in the way the data is handled and what is allowed.

In address register direct addressing you cannot use any of the byte length instructions. move.b 3,d0 is legal but move.b 3,a0 is not allowed because it is a byte operation.

Another difference shows up when working with word length operations. When you move a word (16 bits) into an address register, the sign bit (bit 15, remember we start numbering bits with 0) is "extended" into the upper 16 bits of the register. (The data and address registers of the 68000 are 32 bits long.)

Bit 15 is the sign bit of a 16 bit number. If the most significant bit (bit 15 in our case) is a 1, then the number is negative, if it is 0, the number

continued on page 260

GFA BASIC

continued from page 120

to construct the string. A demonstration program on the GFA BASIC disk uses a totally different method to create a menubar, and although it reads menu selections more efficiently, I prefer the method shown here. It uses less brute force, is easier to track, and easier to modify. The menubar is constructed so desk accessories may be present on the boot disk. You can disable them easily if you so choose.

The next module is the main program loop, which, as you'll see, is a mere four lines long. It simply scans the menubar, and waits for a point and click. When it gets one, it moves on to Procedure Menu.

Now we reach our first defined procedure, Menu. You could handle the same task in a more efficient manner, but not a clearer manner. Here we identify each point and click by its actual name, and refer it to a specific procedure named in a similar manner. Each is sandwiched into an IF-END-IF loop. Why do it this way? Well the best reason is that it makes adding and subtracting elements from your menubar as straightforward as possible. Let's say you decide to eliminate one selection under Graphics, but you'd like to add a whole new header between Mouse and Graphics, with six new selections in it. If you read the menu numerically, you'll have to go in and re-engineer the whole Menu procedure. By doing it this way, all you need to do is revise the data statements, enter your new selections to Procedure Menu, and then make sure you add procedures for each new selection. In a way, this program can actually serve as a "template" for menu creation, and that is the real reason it got written. Note also that the escape hatch is located here. A click on "quit" returns us to the GEM desktop.

Next we see the menu components themselves. The first procedure displays the "About this program" box on the Desk accessories menu. As you can see, constructing an alert box is

continued on page 266

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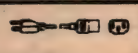

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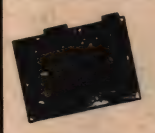

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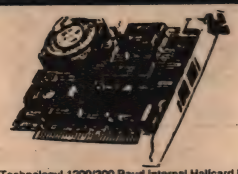

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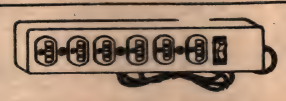

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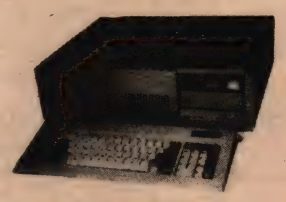

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Math Pack #2

by Wynn Rostek

Welcome to the second Math Pack column. Last month I went over some of the pit-falls to watch for when using a computer for calculations. This month I'm going to present our first actual program, a program to solve systems of linear equations. This program that scientists and engineers need often, and also because it is used to finish the calculations started by many other programs that will be presented.

As I explained last time, I will present each program in such a manner that you should be able to code the program in your favorite language by reading the column and referring to the program presented, even if you don't speak "C."

The first order of business is to explain what a linear system of equations is. I'm sure you know what an equation is, it is a mathematical relationship between some variables or a variable and a constant. X = 3 is an equation even if it is a rather un-interesting one. The equation X = 3 describes a vertical line that passes through the point X = 3.

More common (remember algebra?) are lines that are neither vertical or horizontal, but have some slope. Lines like these have equations that look like 3Y + 4 = X. In this equation we have a relationship between two variables and a constant. In general, an equation can show a relationship between any number of variables, not just 2.

If you remember conic sections from your algebra days, you may remember reading equations like "(X − 1) squared plus (Y − 3) squared equals 25." This equation is an example of a non-linear equation. A linear equation is one in which all the variables appear in the first power, you cannot have a variable squared, cubed or raised to any power greater than 1.

A linear equation cannot contain any of the transcendental functions either. No sin or cos, no log or square root, only variables raised to the first power such as X, Y, W etc.

Now knowing what a linear equation is, we can discuss what a system of linear equations is. In a system of linear equations, we have a set of equations that all contain a common set of variables. Each equation may contain some or all of the variables. The equations express different relationships between the variables. At this point, a simple example is due:

Jason, Bill, and Harry are friends. Twice Bill's age plus 3 times Jason's age minus Harry's age is 68. Jason's age plus Bill's age plus twice Harry's age is 91. Twice Bill's age plus Jason's age minus Harry's age minus 10 is 36. How old are Bill, Harry and Jason?

Remember these little torture devices from school? If you never caught on to the secret of linear systems, these kind of problems could cause you to pull out all your hair!

Let's set up the question in a form that is more easily worked with. Let Jason's age be represented by the variable J. Let Bill's age be represented by the variable B, and we'll use H for Harry's age.

With our representation selected, we can re-write the information.

2B + 3J − H = 68
J + B + 2H = 91
2B + J − H − 10 = 36

This is a system of linear equations! We now arrange them in a standard format. A variable must appear in the same column in each equation, and the constant must appear on the right side of the equals sign. (I will be talking about rows and columns a lot, to remember which way columns run think of the columns of a building, they run up and down.)

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Hacking The ST

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is positive. Sign extension is all that is needed to convert a 16 bit number to a 32 bit number. (2's complement numbering is a topic for another day.)

Moving a word into a data register does not result in sign extension, in this case the upper 16 bits of the register are left alone.

The next addressing mode we'll discuss is address register indirect. In address register indirect addressing, the specified register contains the address.

```
move.w (a0),d0
```

This instruction moves a word into register d0. The 32 bit value contained in register a0 is taken as an address. The word at this address is moved into d0.

We have also seen address register indirect with post-increment. When using this, the first portion of the operation is the same as address register indirect, but after the contents of the specified address register is used as an address, the CPU adds a small value to the contents.

The value added depends on the size of the data. For .b extenders, one is added, for word operations, (.w extenders) 2 is added and for long operations, (.l extenders) 4 is added. The number added is enough to point to the next piece of data.

Very similar to the address register indirect with post-increment addressing mode is address register indirect with pre-decrement. The big difference with this mode is that instead of incrementing the contents of the specified address register after it is used, pre-decrement means that the contents of the specified address register is decremented before it is used.

A typical instruction using address register indirect with pre-decrement addressing is:

```
move.w -(a0),d0 * move a word into d0
```

As in post-increment, the value used to decrement the register contents is determined by the operation size. A .b operation gives a decrement size of 1, .w gives 2 and a .l operation results in a decrement by 4. The above instruction subtracts 2 from the contents of a0 and takes the new value as the address where the word is read from.

The post-increment and pre-decrement versions of address register indirect addressing are complementary. Post-increment is used to search upwards through memory (start at low memory and work your way up) while pre-decrement is useful for working your way down through memory.

Our next addressing mode is address register indirect with displacement. Just like in address register indirect addressing, you specify an address register and the contents of that register is treated as the address. The difference here is that you also supply a 16 bit number which is added to the contents of the specified address register to generate the complete address.

Since a register holds 32 bits and the displacement is 16 bits, the displacement is sign extended to 32 bits before being added to the contents of the specified register. The following statement uses this mode for the source.

```
new: move.w 14(a0),d0 * fetch a word to d0
```

Now comes one of the most complex addressing modes, address register indirect with index. In this mode, the complete address is formed by adding together 3 separate quantities. The first part of the complete address is the contents of one of the address registers. The second part of the complete address is the contents of a second CPU register. The second register is known as the index register. You can use any of the address registers or data registers as the index register.

The third part of the complete address is an 8 bit number specified in the instruction. The 8 bit number is sign extended to 32 bits and added to the sum of the contents of the other two registers.

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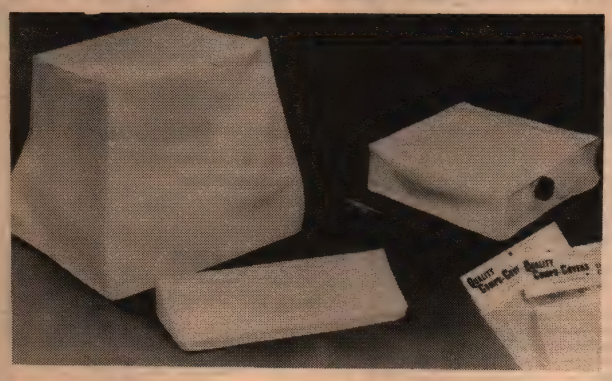

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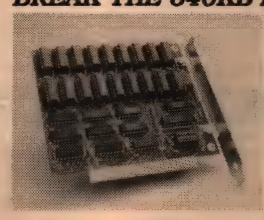

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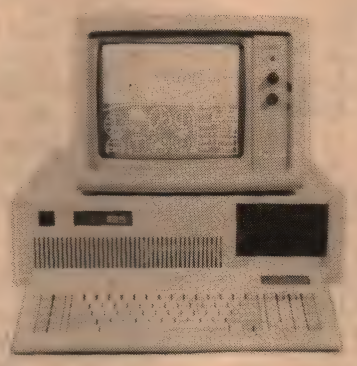

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Hacking The ST
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There is one item that should be mentioned, the index register can be of word size or long. When it is a word quantity, the word is sign extended to 32 bits. An instruction using this mode is shown below.

```
new: move.l 10(a0,d3.w),d0 *
     load a long to d0
```

The first operand uses this addressing mode. Let's look at the pieces that make up the complete address. The first item we encounter 10, is the 8 bit displacement. This is converted into a 32 bit 10 by adding 24 leading 0 bits to it. The 10 is added to the contents of register a0, which is the second part of the complete address. The d3.w is the third part of the address. To generate the third part of the address, the lower 16 bits of register d3 is sign extended to 32 bits and added to the partial address.

We now have added 3 32 bit numbers together to come up with the complete address. The last thing done is to get a long value (4 bytes) from memory at the address we just computed. The long value is then placed in register d0.

The next mode is absolute short addressing. In absolute short addressing, you supply a 16 bit number, which is sign extended to 32 bits to get the actual address. An instruction using this mode is:

```
top: move.w 2734,d0
```

This moves a word from memory location 2734 into register d0.

As you may have guessed, there is an absolute long addressing mode to go with the absolute short addressing mode. In absolute long addressing, you supply a 32 bit number, which needs no sign extension. An instruction to load d0 with a word from location 524367 is:

```
next: move.w 524367,d0
```

The next addressing mode we'll cover is program counter with displacement. This mode is very useful for branching. In this mode, you supply a 16 bit number which is added to the contents of the program counter to generate the address. An instruction using this looks like:

```
botm: bra -294(pc)
```

This instruction causes the program to jump back 294 bytes to get the next instruction. While this is a very useful mode, you rarely see it in this form. Because you normally use symbolic names instead of counting how many bytes back you need to jump, you normally write:

```
botm: bra top
```

Since the assembler knows where top is, it does the counting back for you and computes the value needed, then it translates top to −294(pc) for you.

Our next mode is program counter with index. This works the same way address register indirect with index does except that we use pc instead of an address register. This mode is shown here:

```
mung: beq 26(pc,d3.1)
```

I have seen very few systems where the assembler (or compiler) will generate this code, but the mode is there for those cases where it is needed.

The next mode is one that is very handy, and often used. In immediate mode addressing, the data is part of the instruction! The instruction shown below loads 27 into register d0.

```
esc: move.w #27,d0
```

The "#" character specifies the immediate mode. The CPU gets an instruction that says the source is the next 2 bytes (or 4 bytes).

This brings us to the last addressing mode, status register addressing. If you remember our discussion of flags being set by the compare instruction, you may have wondered where these flags were kept. The CPU lumps these flags together with some other indicators into something called a status register. Even though it is referred to as a status register, it is really only a collection bits.

There are a few operations such as logical AND and logical OR that can be performed on these bits. By using these instructions you can force some of these flags to known states.

The lower 8 bits of the status register is often called the ccr and it contains all of the user flags. The 68000 has a mode called supervisor mode. Some of the instructions of the 68000 can only be executed when the CPU is in the supervisor mode. The upper bits in the status register are associated with the supervisor mode while the lower 8 bits are associated with the user mode.

An instruction to set some of the user flags is:

```
all: ori.b #4;ccr
```

Motorola lumps some of the modes together into implied register mode. There is also a "quick" mode which is like immediate mode except that only a 3 bit positive number is allowed. If you are serious about 68000 assembly language programming, you may want to try and obtain a small card stock folder on the 68000. The only information I have about the folder is the number MC68000/AC REV 2 which appears in the upper right corner of the front cover.

The folder I have was included with the MC68000 16-bit microprocessor manual I received from Motorola. You may want to write to Motorola at: Motorola Semiconductors, 3501 Ed Bluestein Blvd. Austin, Texas 78721.

The folder and booklet supplied are very helpful for people struggling to understand the 68000, and are the final word on the operation of the 68000. ●

Math Pack #2
continued from page 260

After I arrange the equations to fit the rules above we have:

2B − 1H + 3J = 68
1B + 2H + 1J = 91
2B − 1H + 1J = 46

I now come to the juicy part. We are going to perform a series of operations known as "Gaussian Elimination" that leaves the system of linear equations in a form that makes solving for all the variables very simple.

Before we start in on the actual Gaussian Elimination, I need to discuss the kinds of operations that can be performed on a system of linear equations. You can exchange any two columns of the linear system, and you still have a linear system. As an example, assume I wanted to have Jason in the first column and Bill in the second column.

3J + 2B − 1H = 68
1J + 1B + 2H = 91
1J + 2B − 1H = 46

This is an equivalent linear system. If we solved for the three ages of the first set of equations and the second set of equations, we find the same answer for both.

We can also exchange any two rows and still have an equivalent linear system.

1J + 1B + 2H = 91
3J + 2B − 1H = 68
1J + 2B − 1H = 46

Another operation we can perform is scaling. We can multiply any equation by any number and still get the same answer when we are done.

3J + 2B − 1H = 68
2J + 2B + 4H = 182
1J + 2B - 1H = 46
(The above equation has been multiplied by 2.)

The last operation presented is the least intuitive of the bunch, but it is the critical operation in Gaussian Elimination. You can replace any equation (row) with the sum of that row and any other row in the system. As an example:

Replace the second row with the sum of the first and second row.

```
   3J + 2B − 1H = 68
+  1J + 1B + 2H = 91
  ------------------
   4J + 3B + 1H = 159
```

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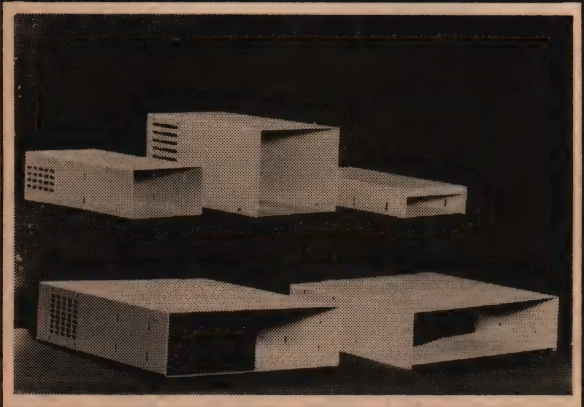

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Reviewed by Randy Holcomb

MacroManager is a desk accessory for the Atari ST series that is a welcome package in its usefulness and ease of use.

Like most desk accessories, MacroManager resides in memory and is available at the desktop by clicking the "MacroManager" entry. MacroManager provides several utilities in one: MacroAnalyst, a powerful calculator that has many of the features of a good hand-held pocket calculator (including business and scientific functions,) a card file/event log; an alarm clock/calendar; a note pad facility, a weekly planner and time accounting system, and a quick-and-dirty "typewriter" mode with some useful features. All of these functions are found in MacroManager.

Installing MacroManager is very easy to do and straightforward, with the documentation explaining the installation process in detail for both monochrome and color systems. Once installed on your boot disk, you must re-boot MacroManager in order to activate it on your ST.

The first time MacroManager is invoked a dialog box as shown in Figure 1 appears. This box allows you to reset the system date and time if necessary, and to determine the kind of modem being used with your system for the auto dialer feature which is available in MacroManager's card file/event log section. Once this dialog box has been satisfied, you are now presented with your major dialog box that MacroManager uses (Figure 2).

The calculator is quite interesting in the fact that it not only provides normal scientific calculator functions but has the ability to create an adding machine tape output by clicking the Tape print icon, and also provides for business calculation for loan payments, and performs operations in both algebraic and RPN (a la HP) modes.

The real heart of MacroManager is the electronic card file, where names, addresses, phone numbers (used by the auto dialer) are handled. When an entry is added to the card base, its date and time stamp are updated, which I find quite useful in determining the age of entries in the card file for possible purging and updating. It should be noted that, like most other desk accessories, MacroManager loads the data files required at boot time during accessory initialization, and depending on the number of entries in the various parts of MacroManager you may find that it starts taking up a good chunk of available memory if you are running on a 520ST. (The accessory itself takes up 70K; compiling a time report adds an additional 5K) but unless you have several hundred or thousand entries in the card database you shouldn't run into space problems. Another nice feature of MacroManager is the ability to print the contents of the card database with the whole card information, the first line and phone number, or the name and the next 3 lines in the database.

The Event Log behaves in much the same manner as the card file does and stores it in a separate database.

The Alarm Facility allows you to create entries in the Alarm database and interfaces with the weekly time planner. As long as your ST is powered

continued on page 272

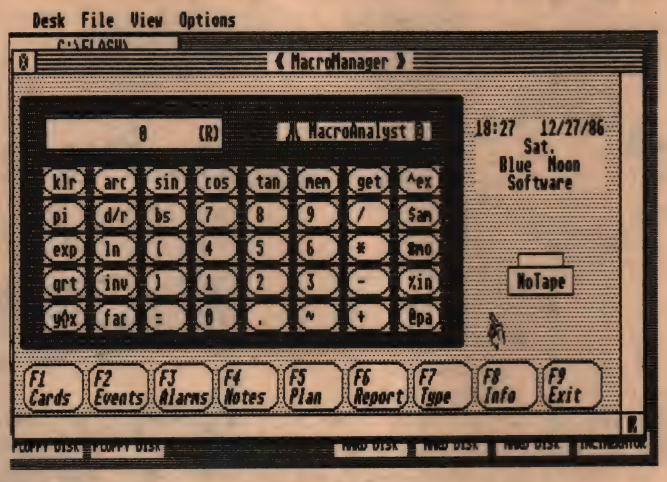

Figure 1. MacroManager Main Dialog Window

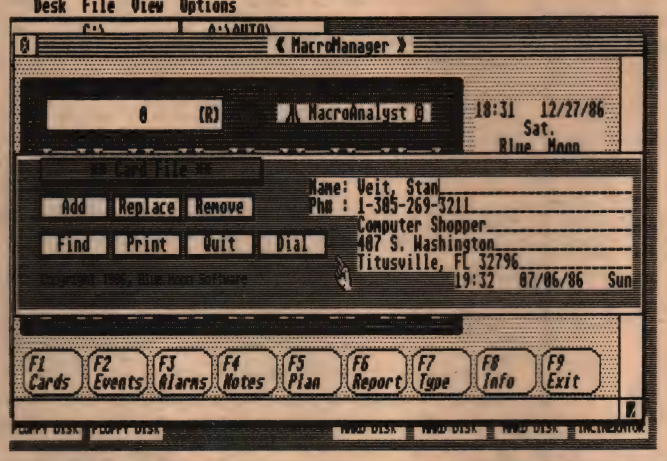

Figure 2. Card File Dialog Box

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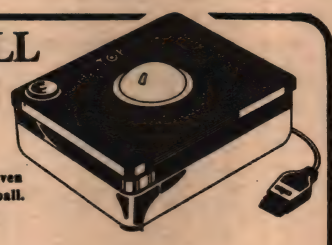

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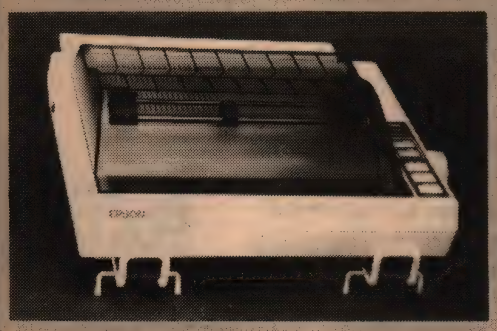

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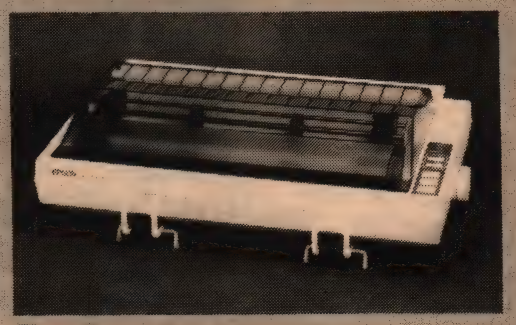

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LQ-1000	Sheet Feeder	189	169
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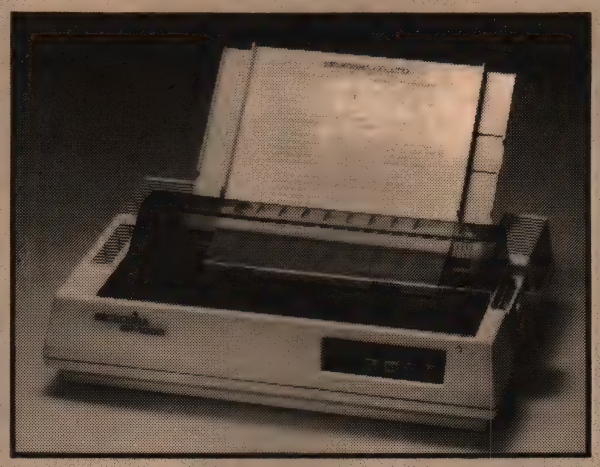

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PRINTOUT SAMPLE

```
789:;<=>?@ABCDEF
<=>?@ABCDEFGHIJKLM
789:;<=>?@ABCDEFGHI
/0123456789:;<=>?@ABCDEFGHI
789:;<=>?@ABCDEF
<=>?@ABCDEFGHIJKLM
789:;<=>?@ABCDEFGHI
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789:;<=>?@ABCD EFGHIJKLMNOPQ
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- Paper empty detection.
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- Right, left margin set function.
- Self test printing.
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Character Font			Character Structure (H x V + Space)	Maximum Column Number	Character Spacing (Character/Inch)	Print Speed (Character/Second)
Standard Character	Standard	Pica	*12x9	80	10	100
		Elite	*12x9	96	12	50
		Condensed	*14x9	137	17	70
	Near Letter Quality	Pica	*24x18	80	10	20
		Elite	*12x18	96	12	24
Italic Cursive Character	Standard	Pica	*16x9	80	10	100
		Elite	*16x9	96	12	50
		Condensed	*18x9	137	17	70
	Near Letter Quality	Pica	*32x18	80	10	20
		Elite	*32x18	96	12	24
Graphic	Single Density Graphic		nx8	480 dot column	—	600 dot column
	Double Density Graphic		nx8	960 dot column	—	490 dot column
	Double Speed, Double Density Graphic		nx8	*960 dot column	—	600 dot column
	Quadruple Density Graphic		nx8	*1920 dot column	—	*980 dot column
	640 Dot Graphic		nx8	640 dot column	—	326 dot column
	576 Dot Graphic		nx8	576 dot column	—	294 dot dolumn
	720 Dot Graphic		nx8	720 dot column	—	367 dot column

*Indicates that the specified figure includes half dots

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GFA BASIC
continued from page 259

really easy, using the GFA BASIC command ALERT.

The procedure Intro simply provides a text block with an explanation of what GFA BASIC is and what this program attempts to do.

Procedure Default displays the four default windows available to GFA BASIC. They are opened, updated, and closed with clicks of the mouse, demonstrating the commands TITLEW, INFOW, OPENW, CLEARW, and CLOSEW. I should note that the documentation clearly states that the CLOSEW command must be used when a window display is completed, and that quick-clicking between four open windows can occasionally result in a crash. I tried coding it in about six different ways, but could not bulletproof the code. In actual practice, your programs will probably not call on four windows to open, update, and close in such quick succession.

Procedure Alert simply shows how alert boxes can be nested and branched, with minimal effort.

Procedure Gem demonstrates what is involved in creating an honest to goodness, movable, sizable window. It is difficult, to say the least, and probably beyond the scope of the beginner. But it can be done.

Procedure Cursor shows how the cursor can be cycled through eight ROM defaults. The command DEFMOUSE also supports user-defined mouse shapes, though this is not demonstrated here.

Procedure Position uses the command MOUSE to read the position of the mouse and print its coordinates.

Procedure Buttons reads the mouse buttons and prints their condition, using the command MOUSE.

Procedure Fonts demonstrates the command DEFTEXT, and shows the fonts, styles, and combinations available with it.

Procedure Graphmode shows how simply graphics can be handled with the GRAI MODE command. It puts small circle on the screen, controlled by the mouse. When you hold the left button down, you can draw with the circle shape.

Procedure Sprite demonstrates the SPRITE command, bouncing an animated block on the screen.

And that's all I wrote.

I had initially written this program on a monochrome ST system, and found upon running it in color that it did require modification—some fields were suddenly way out of range, text was printing in the wrong size, and the like. But the modifications were simple. The version of the program appearing here will run on all ST systems, mono or color. One advantage of the monochrome system while running GFA BASIC, by the way, is a 48-line text mode, wherein a nice big chunk of the program can be seen all at once. You can easily toggle between this mode and regular (23-line) mode.

If you own an Atari ST and you think BASIC has gotten a bum rap, you owe it to yourself to have a look at GFA BASIC. It just might be good enough to clear BASIC's name, at least as far as the Atari ST is concerned.

Remember, this will only happen if you try hard not to use GOTO—unless absolutely, positively necessary.

For more information contact Michtron, 576 South Telegraph, Pontiac, MI 48053. (313) 334-5700. ●

Listing 1

```
'
'-------------------------------------------------------------------
'
'
'  GFA BASIC DEMONSTRATION  -- V 1.0
'
'  by John J. Anderson, Computer Shopper Magazine
'  CompuServe 76703,654
'  Delphi       JOHNANDERSON
'  Genie        J.J.ANDERSON
'
' Absolutely no rights reserved. Feel free to improve, distribute, ignore.
'
'
'------------------------------------------------------ create menu strip
'
Dim Bar$(90)    !   dimension string to hold menu text
For I=0 To 90   !   set up a loop
  Read Bar$(I)  !   read data from data field
  Exit If Bar$(I)="*****"   !until the marker is reached
Next I
Bar$(I)=""    !   tail blanks into string
Bar$(I+1)=""  !   ditto                      --actual menu text follows
Data  Desk , About this program
Data ----------
Data 1,2,3,4,5,6,""
Data  Intro , Introduction ,----------, quit ,""
Data  Windows , Default Windows , Alert Boxes , GEM Windows ,""
Data  Mouse , Cursor Definition , Mouse Position , Mouse Buttons ,""
Data  Graphics , Fonts , Graphmode , Sprites ,""
Data
Data ***
Menu Bar$()   !   activate menu
'
'------------------------------------------------------ main program loop
'
Do
  On Menu
  Gosub Menu    !   All the loop does is say "look at the menu and branch"
Loop
'
'------------------------------------------------------ reading menu
'
Procedure Menu    !   This procedure parses the menu selections
  If Bar$(Menu(0))=" About this program"   !   If this is the selection,
    Gosub About                           !   go to the corresponding procedure
  Endif
  If Bar$(Menu(0))=" Introduction "        !   ditto
    Gosub Intro
  Endif
  If Bar$(Menu(0))=" quit "
    System                                !   the escape hatch
  Endif
  If Bar$(Menu(0))=" Default Windows "
    Gosub Default
  Endif
  If Bar$(Menu(0))=" Alert Boxes "
    Gosub Alert
  Endif
  If Bar$(Menu(0))=" GEM Windows "
    Gosub Gem
  Endif
  If Bar$(Menu(0))=" Cursor Definition "
    Gosub Cursor
  Endif
  If Bar$(Menu(0))=" Mouse Position "
    Gosub Position
  Endif
  If Bar$(Menu(0))=" Mouse Buttons "
    Gosub Buttons
  Endif
  If Bar$(Menu(0))=" Fonts "
    Gosub Fonts
  Endif
  If Bar$(Menu(0))=" Graphmode "
    Gosub Graphmode
  Endif
  If Bar$(Menu(0))=" Sprites "
    Gosub Sprite
  Endif                                   !   sure it's long, but it's easy, too
Return
'
'------------------------------------------------------ menu components
'
Procedure About   !   information box for the program
  Menu Off        !   turn off menu inverse shading
  M$="MGA Basic Tutorial|Version 1.0|John J. Anderson|Computer Shopper"
  Alert 1,M$,1,"OKAY",B
Return
'
'------------------------------------------------------ introduction
'
Procedure Intro   !   a "pseudo-window", made out of a filled rectangle
  Menu Off
  Cls             !   clear the screen
  Deffill 1,0,0   ! define the fill
  Pbox 20,20,550,170   !   draw the box
  Deftext 1,4,0,6      !   define the text font          --text follows
  Text 30,30,"  GFA Basic is a structured Basic that brings the full power of"
  Text 30,40,"the Atari ST to the Basic programmer. It is easy to learn, fast,"
  Text 30,50,"features a powerful 'real-time' editor, and is packed with a"
  Text 30,60,"very complete command set for programming applications."
  Text 30,70," ------------------------------------------------------- "
  Text 30,80,"  It comes with a run-only module that allows you to create "
  Text 30,90,"pseudo-stand-alone applications to share with other Atarians."
  Text 30,100,"Michtron and GFA Systemtechnik promise to release a true com-"
  Text 30,110,"piler soon which will allow for true stand-alone applications"
  Text 30,120,"and even greater speed. The package lists for $79.95."
  Text 30,130," ------------------------------------------------------- "
  Text 30,140,"  This demo program shows just some of the power of GFA Basic."
  Text 30,150,"While using the program, you need never touch the keyboard."
  Text 30,160,"Just point and click, and have fun. - JJA"
  Menu Bar$()   !   reactivate menu bar
```

Listing 1 continued on page 267

Listing 1 GFA BASIC continued from page 266

```
Return
'
'------------------------------------------------------ default windows
'
Procedure Default    !   shows the four default windows
 Graphmode 1    !   make sure you've got the right graphics mode
 Menu Off
 Cls
 Titlew 1,"Window 1"    !   title for the window
 Infow 1," First default window"    !   subtitle for the window
 Titlew 2,"Window 2"
 Infow 2," Second default window"
 Titlew 3,"Window 3"
 Infow 3," Third default window"
 Titlew 4,"Window 4"
 Infow 4," Fourth default window"
 Openw 1
 Q=1    !   initialize variable that tracks active windows
 Hidem    !   do not display mouse
 Repeat    !   start a loop
  K=Mousek    !   read the mouse buttons
  Print At(2,2);"Left mouse button opens windows,"
  Print At(2,3);"right button closes them."
  Print At(2,4);"Press both buttons together"
  Print At(2,5);"to return to menu..."
  If K=1    !   see if left mouse button is being pressed
   Clearw Q    !   clear the contents of current window
   Inc Q    !   increment Q by 1, a neat GFA Basic command
   If Q>4    !   clip the counter within range
    Q=1
   Endif
   Openw Q    !   open new window q
  Endif
  If K=2    !   see if right mouse button is being pressed
   Inc Q
   If Q>4
    Q=1
   Endif
   Closew Q    !   close current window
  Endif
 Until K=3
 For I=1 To 4
  Closew I    !   close all windows
 Next I
 Closew 0    !   return to normal screen
 Menu Bar$()    !   reactivate menu bar
 Showm    !   reactivate mouse
Return
'
'------------------------------------------------------ alert boxes
'
Procedure Alert    !   Somewhat whimsical look at branching windows
 Menu Off
 B=0    !   initialize counters
 C=0
 Alert 2,"Are you impressed|with GFA Basic|so far?",1,"yes|no",B
 If B=2
  Alert 2,"Come on. You must|have seen something|you liked.",1,"yes|no",C
 Endif
 If B=1 Or C=1
  Alert 1,"Glad to hear it.",0,"okay",B    !   person is enthusiastic
 Endif                                     !   or at least non-hostile
 If C=2
  Alert 3,"Trash disk",0,"yes",B    !   person deserves a scare
  System                            !   don't worry, we're not
 Endif                              !   really going to trash anything
Return
'
'------------------------------------------------------ GEM windows
'
Procedure Gem    !   Shows you a sizable, movable window
 Menu Off    !   and the effort it requires
 Cls
 Attr=Windtab+2    !   set attributes for window
 Xpos=Windtab+4
 Ypos=Windtab+6
 Width=Windtab+8
 Height=Windtab+10
 Dpoke Attr,&HFFF    !   poke it in there
 Dpoke Xpos,20
 Dpoke Ypos,20
 Dpoke Width,350
 Dpoke Height,120
 Titlew 1,"GEM WINDOW"    !   name it
 Infow 1,""    !   no info box this time
 On Menu Message Gosub Message    !   read actions on window
 Openw 1    !   open it
 Clearw 1    !   clear it
 Repeat    !   fill it with randomly plotting lines
  Color Rnd+0.5
  Line Rnd*640,Rnd*400,Rnd*640,Rnd*400
  On Menu
 Until M=22    !   until user clicks on the close button
Return
Procedure Message    !   handles sizing, placement, and closure
 M=Menu(1)
 If M=22    !   closure
  Closew 1
  Closew 0
  Menu Bar$()
 Endif
 If M=23    !   full-size button has been pressed
  @Setxybh(0,10,630,180)
 Endif
 If M=27 Or M=28    !   user is custom-sizing window
  @Setxybh(Menu(5),Menu(6),Menu(7),Menu(8))
 Endif
Return
Procedure Setxybh(X,Y,B,H)    !   nasty little chunk of code
 Dpoke Gintin,Dpeek(Windtab)    !   to handle window size
 Dpoke Gintin+2,4    !   and placement
 Gemsys 104
 Xa=Dpeek(Gintout+2)
 Ya=Dpeek(Gintout+4)
 Ba=Dpeek(Gintout+6)
 Ha=Dpeek(Gintout+8)
 Get Xa,Ya,Min(Ba,B),Min(Ha,H),Temp$
 Closew 1
 Dpoke Xpos,X
 Dpoke Ypos,Y
 Dpoke Width,B
 Dpoke Height,H
 Openw 1
 Clearw 1
 Dpoke Gintin,Dpeek(Windtab)
 Dpoke Gintin+2,4
 Gemsys 104
 Put Dpeek(Gintout+2),Dpeek(Gintout+4),Temp$
 Clearw 1
 Closew 0
 Openw 1
Return    !   wish it were easier than this, folks...
'
'------------------------------------------------------ changing cursor
'
Procedure Cursor    !   lets you click through ROM cursor shapes
 Menu Off
 Cls
 Deftext 1,0,0,6
 Text 10,160,"Defmouse { }"
 Text 10,170,"Left mouse button changes cursor,"
 Text 10,180,"right mouse button for menu..."
 Repeat    !   set up a loop
  Pause 10    !   put a brake in to damp selection, as DEFMOUSE works
  Mouse X,Y,K    !   so fast a single click often jumps selections
  If K=1    !   read mouse, see if left button is pressed
   Inc Q    !   if it is, increment counter by 1
   If Q>7    !   clip counter into range
    Q=0
   Endif
   Text 90,160,Q    !   print out the value
   Defmouse Q    !   define the mouse as that value
  Endif
 Until K=2    !   until the right mouse button is finally pressed
 Menu Bar$()
Return
'
'------------------------------------------------------ reading mouse
'
```

Listing 1 continued on page 268

Listing 1 GFA BASIC continued from page 267

```
Procedure Position    !   a real simple one, reading out mouse X and Y
 Menu Off             !   coordinates
 Cls
 Deftext 1,0,0,6
 Text 10,170,"Mouse {  ,  ,0}"
 Text 10,180,"Right mouse button for menu..."
 Repeat
  Mouse X,Y,K
  Text 67,170,X    !   print out the actual value
  Text 99,170,Y    !   ditto
 Until K=2         !   these are sometimes flaky and I don't know why
 Menu Bar$()
Return
'
'------------------------------------------------------ reading buttons
'
Procedure Buttons    !   another simple one to show mouse button presses
 Menu Off
 Cls
 Hidem    !   hide the mouse
 Deftext 1,0,0,6
 Text 10,170,"You are pressing mouse button {  }"
 Text 10,180,"Press both buttons together to return to menu..."
 Repeat
  Mouse X,Y,K        !   read the mouse buttons
  Text 263,170,K     !   print out the actual value
 Until K=3           !   until both buttons are pressed
 Showm               !   reactivate the mouse
 Menu Bar$()         !   reactivate the menu bar
Return
'
'------------------------------------------------------ changing fonts
'
Procedure Fonts    !   lets the user click through available fonts
 Menu Off
 Cls
 Deftext 1,0,0,6
 Text 10,160,"Left mouse button clicks through styles,"
 Text 10,170,"right mouse button clicks through sizes."
 Text 10,180,"Press both buttons together for menu."
 S=0    !   initialize counters
 G=4
 Hidem    !   hide the mouse once again, or it flickers
 Repeat    !   set up a loop
  Pause 10    !   once again, a brake to damp the action
  Mouse X,Y,K
  Text 10,70,T$
  If K=1
   Inc S    !   increment counter on clicks of left mouse button
   Deffill 0,1,1    !   set up a filled rectangle to erase
   Pbox 8,30,350,80    !   previous entries
  Endif
  If S=0    !   this section works same way as menu parser
   T$="normal text"    !   hopefully self-explanatory
  Endif
  If S=1
   T$="boldface"
 Endif
 If S=2
  T$="light"
 Endif
 If S=3    !   clip the counter to next meaningful value
  S=4
  T$="italic"
 Endif
 If S=5
  T$="boldface italic"
 Endif
 If S=6    !   clip the counter
  S=8
  T$="underlined"
 Endif
 If S=9    !   clip the counter once again
  S=16
  T$="bordered"
 Endif
 If S=17
  T$="boldface bordered"
 Endif
 If S=18    !   clip
  S=20
  T$="bordered italic"    !   looks weird, but what the heck
 Endif
 If S=21    !   clip back to the beginning
  S=0
  T$="normal text"
 Endif
 If K=2
  Inc G
  Deffill 0,1,1    !   set up blanking rectangle once again
  Pbox 8,30,350,80
 Endif
 If G=5    !   now we're doing the same thing again, but this
  G=6      !   time we're looking at the right mouse button
 Endif     !   and incrementing a different counter
 If G=7
  G=13     !   calls for a lot of clipping, doesn't it?
 Endif
 If G=14    !   we're changing font sizes here
  G=32
 Endif
 If G=33
  G=4
 Endif
  Deftext 1,S,0,G    !   this is the line that actually does it
 Until K=3
 Menu Bar$()
Return
'
'------------------------------------------------------ graphmode demo
'
Procedure Graphmode    !   draws and "undraws" a circle with the mouse
Menu Off
Cls
Deftext 1,0,0,6
Text 10,160,"Graphmode {mode}"
Text 10,170,"1=replace 2=transparent 3=xor 4=reverse transparent"
Text 10,180,"Left mouse button to draw, right mouse button for menu..."
Repeat    !   set up a loop
 Mouse X,Y,K
 If K=1    !   if the left button is pressed, circle "draws"
  Graphmode 2
 Else
  Graphmode 3    !   otherwise it just sits there, undrawing itself
 Endif
 Circle X,Y,50    !   this line actually plots it
 Circle X,Y,50    !   unplots it unless button is pressed
Until K=2
Graphmode 1    !   reset graphics mode
Menu Bar$()
Return
'
'------------------------------------------------------ sprite demo
'
Procedure Sprite    '   demonstrates a bouncing sprite
 Menu Off
 Cls
 Deftext 1,0,0,6
 Text 10,190,"Hold right mouse button down for menu..."
 A$=Mki$(1)+Mki$(1)+Mki$(0)    !   packs string with sprite data
 A$=A$+Mki$(0)+Mki$(1)
 For I=1 To 16
  A$=A$+Mki$(0)+Mki$(65535)  !   65535 is a solid line
 Next I                      !   read it in 16 times
 Hidem                       !   and it becomes a block
 Repeat
  Mouse X,Y,K
  For I=0 To 190    !   throw it down
   Sprite A$,190,I
  Next I
  For I=190 To 0 Step -1    !   bounce it up
   Sprite A$,190,I
  Next I
 Until K=2    !   until the right mouse button is pressed
 Menu Bar$()
 Showm
Return
'
'
'------------------------------------------------------ END
```

Math Pack #2

continued from page 262

$$3J + 2B - 1H = 68$$
$$4J + 3B + 1H = 159$$
$$1J + 2B - 1H = 46$$

When we are trying to solve a linear system (a system of linear equations) we can perform any sequence of the above operations and we still get the same answer!

We will be trying to solve 3 equations with 3 unknowns. (B, J and H are our 3 unknowns, and the three equations are the three rows of our linear system)

When we perform Gaussian Elimination on the linear system, it is customary to drop the variables and only worry about the coefficients. After we do this, our system looks like:

$$2 - 1 + 3 = 68$$
$$1 + 2 + 1 = 91$$
$$2 - 1 + 1 = 46$$

What we are trying to find is a simple equation that looks like B = 15, or whatever B really equals. The operations we can use are exchange two rows or two columns, scale a row, or replace a row with the sum of that row and another row.

The numbers on the main diagonal (2, 2, and 1 in our example) will be referred to as the pivot elements. In order to get a simple equation like H = 19, we have to eliminate J and B from the equation. The third equation in our linear system needs to look like OB + OJ + XJ = some number.

To arrive at this happy state of affairs, we will "zero out" all elements in a column below the pivot element. When this is completed, the linear system will be "upper triangular." An upper triangular system has all 0s below the main diagonal.

The time has come for an example to show how this is done. We will start by "zeroing out" column 1. The elements in the first column have to be "zeroed out" one row at a time. I am going to "zero out" the 1B from row 2. (Remember that the B is not written so that we can concentrate on the actual numbers.)

The steps in "zeroing out" an element are simple, and are:

1. Scale the row containing the element being eliminated.
2. Replace the row with the sum of the row and the pivot row.

When you go to scale the row, we don't use just any scale factor, we pick a special scale factor that allows us to eliminate the element when we perform step 2.

What we are going to do is replace 1 + 2 + 1 = 91 by scaling this equation and adding the scaled equation to 2 − 1 + 3 = 68. The result of the addition should have a 0 as the first element. Since I am adding the scaled equation to 2 − 1 + 3 = 68, the scaled equation must start with −2.

Since I need a better way to talk about the numbers in the linear system, I will introduce a convention here that allows us to talk about a number without worrying about what the actual number is.

When we store the data that makes up the linear system in our computer, we will store it

continued on page 272

Listing 1

```
/* 01/01/87 Started work on this file */

#include <stdio.h>
#include <math.h>

/* this file contains the routines that allow us to solve systems */
/* of linear equations                                            */

/* this program expects to be passed the name of a file that contains */
/* the size of the array and all the entries in the array             */
/* by keeping this information on disk, and leaving the answer on the */
/* disk, we can chain the programs together with batch files          */

/* the data in the input should consist of a series of numbers   */
/* one per line.  The first number (an integer) is the number of */
/* rows in the augmented matrix.  The second integer is the      */
/* number of columns in the matrix. The entries that follow are  */
/* the actual data.  You should have the first number from the   */
/* first row, then the second number from the first row, then    */
/* the third number from the first row, etc.  You then have the  */
/* first number from the second row, second number from the      */
/* second row and so forth                                       */


/*****************************************************************/
/*                                                               */
/* Notes for people adapting this program...                     */
/*                                                               */
/*  1. You will have to write and link in your own waitkey()     */
/*     This function prints hit any key to continue, then it     */
/*     waits for the operator to hit a key.                      */
/*                                                               */
/*  2. Watch all the printf statements that handle floating      */
/*     point values, the format specification varies from        */
/*     compiler to compiler.                                     */
/*                                                               */
/*  3. Watch for funtions that return VOID, some compilers want  */
/*     to see void, while other require #define VOID int        */
/*     Alcyon doesn't recognize void as valid, so I have added   */
/*     #define VOID int to my stdio.h file                       */
/*                                                               */
/*  4. math.h is only used because it contains the declaration   */
/*     double fabs(); which keeps you from having to declare it  */
/*     in all the functions where it is used...                  */
/*                                                               */
/*  5. watch the value you use for small, most systems only      */
/*     offer 4 or 5 digits, use small /= 1000.0 for them         */
/*                                                               */
/*****************************************************************/

/* these defines control the size of the system we can solve   */
/*                                                             */
/* MAXCOL should be one larger than MAXROW                     */
/*                                                             */
/* it would be nice if all C preprocessors allowed:            */
/* #define MAXCOL (MAXROW + 1)                                 */
/* but many (most) do not.  Oh well...                         */
/*                                                             */

#define MAXROW 10              /* number of rows in the array    */
#define MAXCOL 11              /* number of columns in the array */

/* this define determines if we do diagnostics or not */
#define test TRUE

/* a few useful globals */
double a[MAXROW][MAXCOL];      /* our array of floating point numbers  */
double u[MAXROW][MAXCOL];      /* this holds our upper triangle matrix */
double result[MAXCOL];         /* the solution to the system           */
int arb[MAXCOL];               /* flags for arbitrary variables        */

/* here are some of the globals used for solving the linear system    */
int mxrow;                     /* last valid row number                */
int mxcol;                     /* last valid column number             */
int np;                        /* indicates limits for non-regular systems */
double small;                  /* we test for close to 0.0, not equal to 0.0 */
                               /* this is our close to 0.0 value       */
                               /* we need to do this because:          */
                               /* there is about a one in a million chance */
                               /* of a calculation yielding exactly 0.0    */
                               /* ain't discrete math wonderful?       */

/* these globals are general purpose */
FILE *dfile;                   /* diagnostic message file              */

main(argc,argv)

int argc;
char *argv[];

{
FILE *fopen();
FILE *infile;
FILE *outfile;
double ab;
int numrow;
int numcol;
int numchar;
int r;
int c;
double ftemp;
char outnme[80];
int i;
int sol;
int narb;

/* the first thing we need to do is see if we got a file name */
if (argc < 2)
    {
    printf("Sorry, you must supply a file name.\n");
    printf("Program is terminating.\n");
    waitkey();
    exit(-1);
    }

/* now we open the source file for reading */
infile = fopen(argv[1],"r");
if (infile == NULL)
    {
    printf("Unable to open %s for reading.\n",argv[1]);
    printf("Program is terminating.\n");
    waitkey();
    exit(-1);
    }

/* now that the file is open, read in the size of the array */
numchar = fscanf(infile,"%d",&numrow);
if (numchar < 1)
    {
    printf("Row size missing.\n");
    printf("Unable to continue, program is terminating.\n");
    waitkey();
    exit(-1);
    }
/* show the operator the data */
printf("%d rows\n",numrow);

numchar = fscanf(infile,"%d",&numcol);
if (numchar < 1)
    {
    printf("Column size missing.\n");
    printf("Unable to continue, program is terminating.\n");
    waitkey();
    exit(-1);
    }
/* show what we got */
printf("%d columns\n",numcol);

/* now we check to see if the size is valid */
mxrow = numrow - 1;
mxcol = numcol - 1;

/* first we see if it is too small */
if (mxrow < 1)
    {
    printf("%d rows specified.\n",numrow);
    printf("Invalid size for linear system.\n");
    printf("Program is terminating.\n");
    waitkey();
    exit(-1);
    }

if (mxcol < 2)
    {
    printf("%d columns specified.\n",numcol);
    printf("Invalid size for linear system.\n");
    printf("Program is terminating.\n");
    waitkey();
```

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```
    exit(-1);
    }

/* now we see if it is too large */

if (numrow > MAXROW)
    {
    printf("%d rows specified.\n",numrow);
    printf("This program works with %d rows maximum.\n",MAXROW);
    printf("Change MAXROW define and recompile.\n");
    printf("Program is terminating.\n");
    waitkey();
    exit(-1);
    }
if (numcol > MAXCOL)
    {
    printf("%d columns specified.\n",numcol);
    printf("This program works with %d columns maximum.\n",MAXCOL);
    printf("Change MAXCOL define and recompile.\n");
    printf("Program is terminating.\n");
    waitkey();
    exit(-1);
    }

/* now we open the diagnostic file if needed */
if (test)
    {
    dfile = fopen("TRACE.DAT","w");
    if (dfile == NULL)
        {
        printf("Unable to open TRACE.DAT for writing.\n");
        printf("Program is terminating.\n");
        waitkey();
        exit(-1);
        }
    }
/* since we made it here, we can start reading in the data */
/* we assume that the data is in row major format          */

/* the number below is supposed to be much larger than any */
/* number in your matrix, if your numbers are very large,  */
/* you may need to increase the value here                 */
small = 1000000.0;

r = 0;
FOREVER
    {
    c = 0;
    FOREVER
        {
        numchar = fscanf(infile,"%F",&ftemp);
        if (numchar < 1)
            {
            printf("Attempted to read array[%d][%d].\n",r,c);
            printf("Data not present.\n");
            printf("Unable to continue, program is terminating.\n");
            waitkey();
            exit(-1);
            }
        /* show the data */
        printf("%F\n",ftemp);
        /* we also keep track of the smallest value */
        ab = fabs(ftemp);
        if (ab < small) small = ab;
        a[r][c] = ftemp;
        c++;
        if (c > mxcol) break;
        }
    r++;
    if (r > mxrow) break;
    }

/* since there is NO chance of a floating point number being 0.0 ,  */
/* we test for it being close enough to 0.0 instead.                */
/* if you have floating point numbers with less than 64 bits, you   */
/* will need to use a number like 1000.0 in the next line.          */
/* you may also have to change this line if you are working with    */
/* really large or really small numbers in your matrix.             */
small /= 100000.0;

/* we also compute limits to handle non-regular systems */
if (mxcol > mxrow) np = mxcol;      /* normal system */
else np = mxrow - 1;

/* we can close the input file, we are done with it now */

fclose(infile);

/* now that we have all the data, do Gaussian elimination */
printf("Ready to start gaussian elimination.\n");
gaussian();

/* save a copy of the upper triangular matrix */
save();

/* now we do backward substitution */
printf("Ready to start backward substitution.\n");
sol = backward();

/* save a copy of the matrix now */
save();

/* now we save the results to a file */
printf("Saving results.\n");
/* we start off by creating the file */

/* first we decide which name to use */

if (argc > 2)
    {
    /* user supplied an output file name */
    strcpy(outnme,argv[2]);
    }
else
    {
    /* we use the default file name */
    strcpy(outnme,"LINSYS.SOL");
    }

/* now we open the file */
outfile = fopen(outnme,"w");
if (outfile == NULL)
    {
    printf("Unable to open %s for writing.\n",outnme);
    printf("Program is terminating.\n");
    waitkey();
    exit(-1);
    }

/* actually store the data */
for (i = 0;i < np;i++) fprintf(outfile,"%F\n",result[i]);

/* now we show the results */
if (!sol) fprintf(outfile,"System inconsistant\n");

/* see if we have any arbitrary variables */
narb = 0;
for (i = 0;i < MAXCOL;i++) if (arb[i]) narb++;
if (narb == 0) fprintf(outfile,"Solution unique\n");
else fprintf(outfile,"%d arbitrary variables.\n",narb);

/* if there are arbitrary variables, show which ones they are */
for (i = 0;i < MAXCOL;i++) if (arb[i]) fprintf(outfile,"X%d is
arbitrary\n",i);


/* for arbitrary variables, show the basis vectors */


/* and close the results file */
fclose(outfile);

/* and last but not least, close the diagnostics file */
if (test) fclose(dfile);
}

/* from here down we have the routines that support the solution */

VOID gaussian()

/* this routine performs gaussian elimination on the matrix */
{
int i;
double ab;

for (i = 0;i < np;i++)
    {
    docol(i);     /* partial pivoting */
    ab = fabs(a[i][i]);
    if (ab < small) a[i][i] = 0.0;
    else zrocol(i);
    }
}


VOID docol(col)

int col;

/* this routine handles a single column   */
/* we perform partial pivoting            */
{
double ab;
double big;
int large;
int i;

/* first we find the largest element */
big = fabs(a[col][col]);
large = -1;
for (i = col;i <= mxrow;i++)
    {
    ab = fabs(a[i][col]);
    if (ab > big)
        {
        big = ab;
        large = i;
        }
    }

/* now that we have found the largest value */
/* we can do the partial pivot if need be   */
if (large != -1) swaprow(col,large);
}


VOID swaprow(source,dest)

int source;
int dest;

/* this routine is used to swap two rows */
/* elements below source column are 0.0  */
{
double temp;
int col;

for (col = source;col <= mxcol;col++)
    {
    temp = a[source][col];
    a[source][col] = a[dest][col];
    a[dest][col] = temp;
    }
}



VOID zrocol(col)

int col;
```

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```
/* this routine is used to do the actual column reduction */
{
int row;
double fac;

for (row = col + 1;row <= mxrow;row++)
    {
    /* compute the scale factor */
    fac = -1.0 * (a[col][col]/a[row][col]);

    /* scale the row */
    sclrow(row,col,fac);

    /* and sum the rows */
    sumrow(row,col);
    }
}


VOID sclrow(row,col,fac)

int row;
int col;
double fac;

/* this routine is used to scale a row of the matrix */

/* elements left of col are already 0.0                */
{
int i;

for (i = col + 1;i <= mxcol;i++) a[row][i] *= fac;
}


VOID sumrow(row,col)

int row;
int col;

/* this routine is used to add two rows */
{
int i;

a[row][col] = 0.0;
for (i = col + 1;i <= mxcol;i++) a[row][i] += a[col][i];
}


int backward()

/* this routine is used to perform backward substitution    */
/* this routine returns FALSE if the system is inconsistant */
{
int i;
int numarb;
int hi;
int lo;
int solution;


/* show what we are starting with */
save();


/* the first thing we do is to take care of the obvious arbitrary */
/* variables, when we have more variables than equations          */
for (i = 0;i <= mxcol;i++) arb[i] = FALSE;

numarb = (mxcol - 1) - mxrow;
if (numarb > 0) for (i = (mxrow + 1);i < mxcol;i++) arb[i] = TRUE;

/* now we can start solving for the variables */
/* find the upper limit first */
if (mxrow < (mxcol - 1)) hi = mxrow;
else hi = mxcol - 1;

for (i = hi;i > -1;i--)

    {
    solution = subl(i);
    if (!solution)
        {
        /* looks like there is no solution, the system is inconsistant */
        printf("System is inconsistant.\n");
        printf("No solution space exists.\n");
        waitkey();
        return(FALSE);
        }
    }

/* it is still possible for the system to be inconsistant */
/* we need to check here for it...                        */
if (mxrow < mxcol)
    {
    /* under this circumstance we have a solution */
    printf("Solution found.\n");
    return(TRUE);
    }

for (i = mxcol;i <= mxrow;i++)
    if (result[i] != 0.0);
        {
        /* oops, inconsistant */
        printf("System is inconsistant.\n");
        printf("No solution space exists.\n");
        waitkey();
        return(FALSE);
        }
}
```

```
int subl(row)

int row;

/* this routine is used to solve for a single variable */
/* or column in our backward substitution              */
{
double ab;

/* first we have to test to see if the variable is arbitrary */
/* we check the pivot element for a value of 0.0             */
ab = fabs(a[row][row]);
if (ab < small)
    {
    /* looks like the pivot element is zero */
    ab = fabs(a[row][mxcol]);
    if (ab < small)
        {
        /* looks like the value is 0.0 also */
        arb[row] = TRUE;
        return(TRUE);
        }
    else return(FALSE);
    }

/* since we made it here, it's not an arbitrary variable */
/* and the system is not inconsistant (at least not yet) */
/* so we can now solve for the value of the variable     */
result[row] = a[row][mxcol]/a[row][row];
ab = fabs(result[row]);
if (ab < small)
    {
    /* we computed the variable to be equal to 0.0 */
    result[row] = 0.0;
    return(TRUE);
    }

/* since we made it here, the variable is not */
/* equal to 0.0 so we have to subtract the    */
/* variable from the other equations          */
if (row == 0) return(TRUE);

/* we have to factor the variable out of the other equations */
subvar(row,result[row]);
return(TRUE);
}


VOID subvar(row,value)

int row;
double value;

/* we have to factor out the variable of the other equations */
/* above this one in the matrix                              */
{
double diff;
double temp;
double ab;
int col;

col = row;
row--;        /* start above the row just solved */

FOREVER
    {
    diff = value * a[row][col];
    temp = a[row][mxcol] - diff;
    ab = fabs(temp);
    if (ab < small) temp = 0.0;
    a[row][mxcol] = temp;
    a[row][col] = 0.0;
    row--;
    if (row < 0) break;
    }
}



VOID show()

/* this routine is used to show the array              */
/* it is a handy diagnostic if you are having problems */
{
int r;
int c;

for (r = 0;r <= mxrow;r++)
    {
    for (c = 0;c <= mxcol;c++) printf("%-12F",a[r][c]);
    printf("\n");
    }
printf("\n\n");
waitkey();
}



VOID save()

/* this routine is used to save the array contents to disk */
/* it is a handy diagnostic if you are having problems     */
{
int r;
int c;

/* see if we are trouble shooting */
if (!test) return;

for (r = 0;r <= mxrow;r++)
    {
    for (c = 0;c <= mxcol;c++) fprintf(dfile,"%-12F",a[r][c]);
    fprintf(dfile,"\n");
    }
fprintf(dfile,"\n\n");
}
```

Figure 3. Alarm Dialog Box

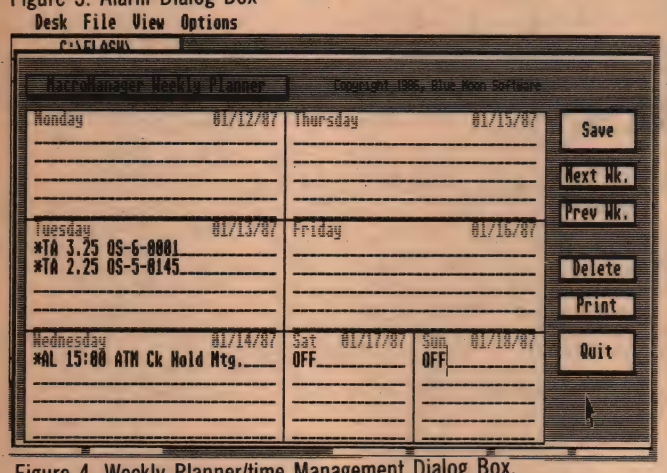

Figure 4. Weekly Planner/time Management Dialog Box.

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MacroManager
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up MacroManager will throw up a dialog box when the alarm time and date have been reached. To shut the alarm off you have to click it off or hit RETURN. This is nice if your ST is on constantly and you use it constantly; otherwise its useability is limited as it won't queue up events that have passed by after you have turned on your ST! The alarm entry can be set for either one-shot or recurring processing.

The Note Pad is a quick and easy way to edit small ASCII files without having to fire up a word processor or text editor: just click or use function key for the note pad and you get this nice large dialog box into which you can enter your text, along with the pathname of the file to save the text in, as well as options to print the contents of the note pad and scroll the pages forward and back. Each note pad can hold just a shade over 4.5K fully loaded (60 lines of 70 characters) and you can have as many note pads as you wish (disk size being the only limiting factor).

The Weekly Planner is unique in that it has hooks to the alarm system and the time analysis section. What you do is set up a weekly itinerary and enter items on the weekly planner dialog box and proceed to enter the items in the appropriate day. If you prefix the entry with "*AL" MacroManager will send the entry to the alarm system and will force the alarm up when the date is reached and it won't go away until you acknowledge it. You can optionally attach a time for the alarm to appear and MacroManager will automatically set up the alarm to fire off at the proper date and time. In both cases, any text entered in the weekly planner will be shipped off to the alarm database and will be displayed accordingly.

For time management entries, you prefix the entry with a "*TA" followed by a time unit and the project code or name. Each project code can be up to 24 characters in length and the time accounting section can compile up to 200 unique project id's per report. (A word of caution MacroManager treats uppercase and lowercase characters in time accounting as different entries; i.e. "project1" and "PROJECT1" are treated as two unique entries.)

The MacroType Electronic Typewriter makes MacroManager act as a pseudo electronic typewriter using margins, tab stops and justification. It allows lines as long as 70 characters to be

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Math Pack #2
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in a matrix. The matrix will have (number of unknowns + 1) columns and (number of equations) rows. If I call the array A, I can therefore refer to any number in symbolically by saying A[row][col]. (The upper left element of this array is usually referred to as A[1][1].)

The scale factor we need is computed:

$-(A[pivot][pivot]/A[row][pivot])$

In our case, the pivot is 1 and the row is 2. A[1][1] is 2 and A[2][1] is 1 so our scale factor is $-2/1$ or -2.

Now that we have the correct scale factor, we scale equation (row) 2.

$(-2) * 1 + 2 + 1 = 91$ is
$-2 - 4 - 2 = -182$

We now sum this equation with the pivot equation. (row 1)

$$\begin{array}{rrrrr} 2 & - & 1 & + & 3 = 68 \\ + & -2 & - & 4 & - 2 = -182 \\ \hline 0 & - & 5 & + & 1 = -114 \end{array}$$

(This is our new equation)

We now substitute the new equation for our old equation 2.

$2 - 1 + 3 = 68$
$0 - 5 + 1 = -114$
$2 - 1 + 1 = 46$

Now we are ready to "zero out" A[3][1]. We compute the new scale factor $-(A[1][1]/A[3][1])$ or $-2/2 = -1$. We scale equation 3:

$-1 * 2 - 1 + 1 = 46$ is
$-2 + 1 - 1 = -46$

Sum this with the pivot equation:

$$\begin{array}{rrrrr} 2 & - & 1 & + & 3 = 68 \\ + & -2 & + & 1 & - 1 = -46 \\ \hline 0 & + & 0 & + & 2 = 22 \end{array}$$

Now we substitute this new equation for the old equation 3.

$2 - 1 + 3 = 68$
$0 - 5 + 1 = -114$
$0 + 0 + 2 = 22$

In normal cases, we would have to "zero out" column 2 also, but in this case we already have the linear system in upper triangular form. Most times you would have to start with the pivot being 2 and go through the whole "zero a column" routine, then do it again with a pivot of 3 and so on until the system was in upper triangular form.

Once the system is in upper triangular form, we use backward substitution to solve the system. Solving for J is easy enough, we have $2J = 22$, so Jason's age is 11. Now that we have solved for J, we can subtract out J from the equations above it. In equation 2 we have $-5H + J = -114$. We multiply the coefficient of J times the actual value of J and subtract that from the constant. We then do the same thing for equation 1. We end up with:

$$\begin{array}{rrrrr} 2 & - & 1 & = & 35 \\ 0 & - & 5 & = & -125 \\ 0 & & 0 & = & 22 \end{array}$$

Now we can solve for another variable, this time H. We have $-5H = -125$ so $H = -125/-5 = 25$. We now subtract out H from the equations above it (only equation 1 in this case) and we get:

$$\begin{array}{rrrrr} 2 & & 0 & = & 60 \\ 0 & - & 5 & = & -125 \\ 0 & & 0 & = & 22 \end{array}$$

Of course solving for B is simple, $2B = 30$, $B = 60/2 = 30$.

We now know that Jason is 11, Harry is 25 and Bill is 30. It always seems a little like magic to me that we could extract this from the information presented in the problem, but that is the power of linear systems.

This simple outline will give you the basic idea behind Gaussian Elimination and backward substitution. The source code for an implementation of this technique is presented in Listing 1. A few points about the listing need to be presented.

In C, all arrays start with element 0, not 1 as in many other languages. Keep an eye on your array numbers when you convert the program to another language. You will also see a lot of tests being done that will not make sense, this is because we have not yet discussed all of the different situations that can arise when dealing with linear systems. A better explanation of things that can go wrong, and how to get around them will be presented in the next article.

If there is interest in these programs, I will supply the source code and executable versions of the programs on 3½ disks for the Atari ST line of computers and on 5¼ disks for the IBM PC and compatibles. (Only the 360K drives for the IBM.) If you want the program but don't want to type it in, send $5 to:

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Wanderer

Reviewed by Jeff Brenner

Wanderer is a new action/adventure game, imported from France, for the Atari ST. The game's claim to uniqueness is its simulated three dimensional action. Not your standard 3D game graphics fare, mind you, where objects are merely drawn in a 3D perspective on the 2D screen, but full bodied, animated graphics that appear to move within the depths of your color monitor and sometimes even jump out at you from the screen. These aren't exaggerations, because Wanderer is used with 3D glasses, those same colored glasses used to watch the old 3D movies (non-colored polarized glasses have been the norm in the recent 3D movie resurgence).

Who Wrote This Plot?

Apparently, in their quest for originality and novelty, the authors have built the game around a plot so ridiculous that it is best ignored. What is the plot, you ask? In none other than 2986, cats are being kidnapped (yes, cats) and are slowly but surely disappearing from the face of the Earth. "Something must be done," the manual explains, "the cats must be found." Fortunately, the caretaker of the Shangri La Mansions, who lost her cat, found a playing card left behind by the kidnappers. The card leads you to "The Galaxy" where an interplanetary game of poker is being played. Your mission: Serve as a courier in "The Galazy" to bring cards from one planet to another and try to better each planet's hand. Your payment: Cats. But there's more nonsense splattered throughout this plot, including the "powerful ARK," which has been stealing the cats, black holes, and of course the SPHYNX, which you must ultimately battle after you've collected 8000 cats or five aces.

Playing The Game

Stripped of its plot, the game is more or less of a shoot-em-up, but probably one of the most exciting shoot-em-up games you've ever played. The three dimensional effects, once you can see them, are superb. The objects are simple

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MacroManager
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typed to the printer directly from the keyboard.

Anomalies and quirks. MacroManager appears to act erratically when used with certain desk accessories and/or programs; most noticeably with ARC.TTP and Thunder. If you make heavy use of the card file be prepared to start running out of memory if you have a 520ST. Also, I noticed that (like many other programs) it likes to alter the screen color on invocation, forcing you to pull the Control Panel down to reset the palette properly. Finally, it would have been nice if MacroManager would allow you to specify a directory to place all of the files it uses (a la Thunder) as opposed to defaulting to the root volume (for the card file, events and alarms) or the current working directory (for notes and plan files.)

Summary. MacroManager is a nice little desk accessory that deserves to be looked at and for someone who needs the kind of functionality that MacroManager has, it would be well worth the investment. ●

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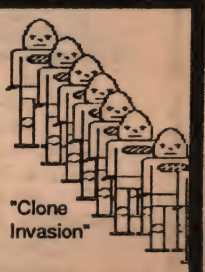
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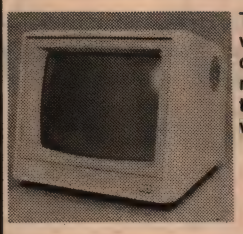

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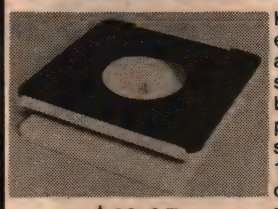

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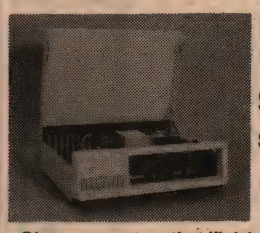

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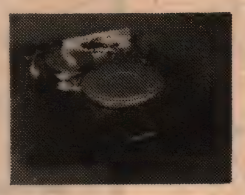

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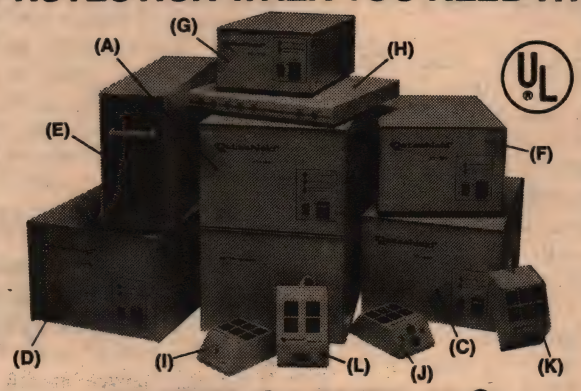

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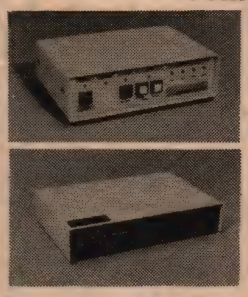

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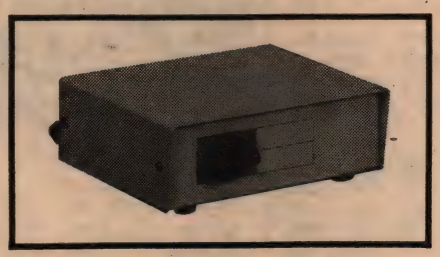

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AB254E	DB-25 25 Line Four Way.	**49.95**
AB25XE	DB-25 25 Line Crossover	**49.95**
AB362E	Centronics 36 Line Two Way	**49.95**
AB364E	Centronics 36 Line Four Way	**59.95**
AB36XE	Centronics 36 Line Crossover	**59.95**

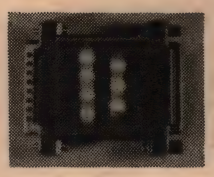
MODULAR TO RS-232 ADAPTER KITS

Turns any 25, 15 and 9 pin port into a modular jack, with either a 4, 6 or 8 pin connection. Use these with the modular cable assemblies (see below) to make your own custom cables.

Unit partially disassembled to show construction.

- MA-4M 25, 15, 9 Male to 4 pin modular **$4.50**
- MA-4F 25, 15, 9 Female to 4 pin modular **$4.50**
- MA-6M 25, 15, 9 Male to 6 pin modular **$4.50**
- MA-6F 25, 15, 9 Female to 6 pin modular **$4.50**
- MA-8M 25, 15, 9 Male to 8 pin modular **$4.95**
- MA-8F 25, 15, 9 Female to 8 pin modular **$4.95**

Solve your interconnection problems with our *PROBLEM SOLVERS*



- Null Modem Adapter **$ 9.95**
- Mini Patch Box **$ 9.95**
- SurgeProtector **$14.95**
- Mini Tester **$14.95**

- Gender Changer AGC-M09 AGC-F09 **$6.95**
- Gender Changer AGC-M25 AGC-F25 **$7.95**
- Gender Changer AGC-M36 AGC-F36 **$9.95**

MODULAR CONNECTIONS

Telephone Modular Cable Assemblies (plug to plug)

Part #	Description	Prices
MC-4M	4 pin cable	1.00+.09ft.
MC-6	6 pin cable	1.00+.12ft.
MC-8	8 pin cable	1.25+.15ft.

Modular Plugs

Part #	Description	Ea.	100 ea.
MP-4M	4 pin mini handset modular	0.25	14.95
MP-4	4 pin modular plug 4x6	0.25	14.95
MP-6	6 pin modular plug 6x6	0.25	15.95
MP-8	8 pin modular plug 8x8	0.35	26.95

Modular Wire

Part #	Description	100 ea.
MW4-100	100 ft. 4 conductor	6.95
MW4-500	500 ft. 4 conductor	29.95
MW4-1000	1000 ft. 4 conductor	49.95
MW6-100	100 ft. 6 conductor	8.95
MW6-500	500 ft. 6 conductor	39.95
MW6-1000	1000 ft. 6 conductor	64.95
MW8-100	100 ft. 8 conductor	12.95
MW8-500	500 ft. 8 conductor	54.95
MW8-1000	1000 ft. 8 conductor	99.95

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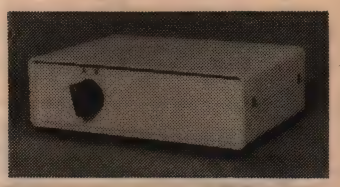
INCLUDING COMPUTERFACTS™ AND OTHER GUIDES!

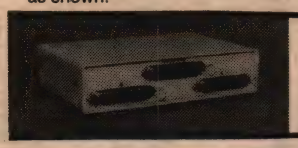
Call for details!

Looking for those hard to find switchboxes for those unusual applications? Try these unique data transfer switchboxes!

Compact, yet strong — these switchboxes feature durable metal cases for effective shielding and gold-plated contacts for positive connections.

All boxes in this section have a front plate with a **2** position switch as shown.



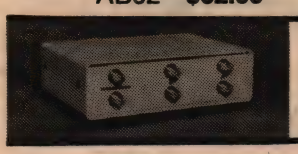


2 position, 50 pin, 57 series. AB57502 **$144.00**

2 position, 50 pin, 'D' series. AB502 **$169.00**

2 position, 15 pin, 'D' series. AB152 **$77.00**

2 position, 9 pin, 'D' series. AB92 **$62.00**



2 position, (BNC-TNC) WANG. ABWANG2 **$89.00**

2 position, TNC. ABTNC2 **$62.00**

2 position, BNC. ABBNC2 **$62.00**

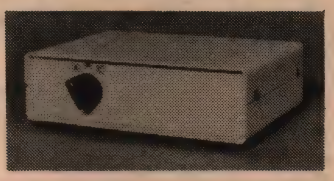
2 position, TWINAX. ABTWX2 **$89.00**

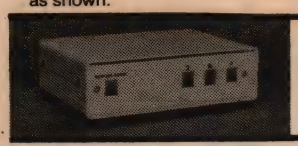
2 position, UTILITY. ABUTL2 **$76.00**

Move up to modern communications with these switchboxes which utilize modem cable for connections.

These switchboxes feature the same rugged and dependable specifications as the above mentioned switchboxes.

All boxes in this section have a front plate with a **3** position switch as shown.





4 position, 4 or 6 pin modular ABRJ1164 **$49.00**

4 position, 8 pin modular ABRJ4584 **$54.00**

BALUNS

Example (RG-62 BNC male shown)

$15.95 ea.

Interface — RG-62 coax cable w/BNC connector, RJ-11 socket or screw terminals for telephone or twisted pair system.

Specs
- Voltage rating — 12V peak to peak max.
- HIPOT — 500V rms, 60 Hz.
- Operating temp — 0° C to 55° C.
- Data rates — 500K bps to 5M bps.
- Distance in feet — 1000

RG-62 BNC male to modular jack
RG-62 BNC female to modular jack
RG-62 BNC male to screw-on terminals
RG-62 BNC female to screw-on terminals

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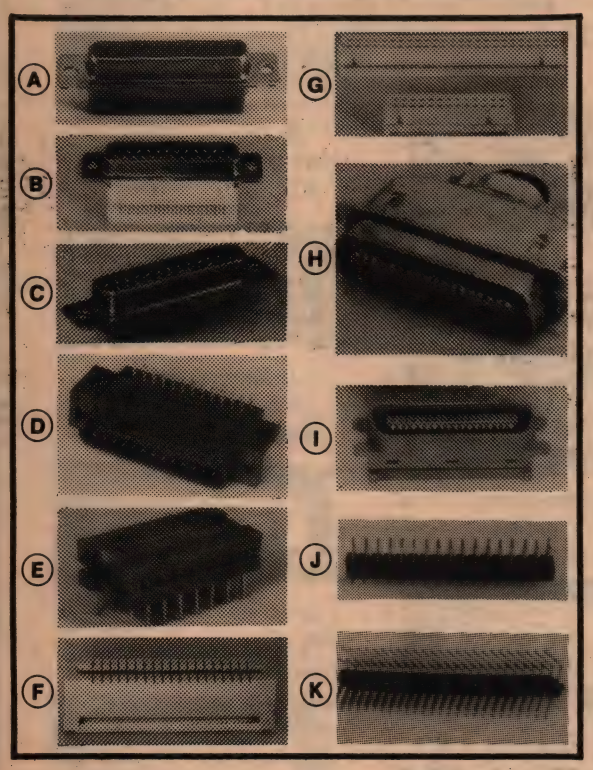
D-SERIES AND RIBBON CABLE CONNECTORS

At Altex Electronics, Inc., we carry ribbon cable connectors, PC, edgecard and break-away connectors, just to name a few — including those for unusual applications.



(A) SOLDER POT

PART #	PRICE/QTY 1-49	50-99	100-499
9P	0.75	0.56	0.45
9S	0.80	0.60	0.48
15P	1.03	0.78	0.62
15S	1.10	0.83	0.66
19P	1.62	1.22	0.97
19S	1.62	1.21	0.97
25P	1.10	0.83	0.66
25S	1.20	0.97	0.78
37P	2.14	1.61	1.28
37S	2.41	1.81	1.45
50P	2.62	2.38	2.18
50S	3.70	3.36	3.08

(B) RIBBON CABLE TYPE

PART#	PRICE/QTY 1-49	50-99	100-499
IDC9P	2.35	2.17	2.01
IDC9S	2.53	2.34	2.17
IDC15P	3.10	2.86	2.66
IDC15S	3.25	3.00	2.79
IDC25P	3.73	3.09	2.62
IDC25S	3.73	3.09	2.62
IDC37P	4.75	4.38	4.07
IDC37S	5.63	5.20	4.83
IDC50P	12.98	11.98	11.13
IDC50S	14.47	13.35	12.40

(C) PC MOUNT STRAIGHT

PART #	PRICE/QTY 1-49	50-99	100-499
P9P	0.90	0.82	0.75
P9S	1.38	1.25	1.15
P15P	1.12	1.02	0.93
P15S	1.98	1.80	1.65
P25P	1.56	1.42	1.30
P25S	3.06	2.78	2.55
P37P	2.14	1.95	1.78
P37S	4.36	3.96	3.63
P50P	2.74	2.49	2.28
P50S	5.68	5.16	4.73

(D) PC MOUNT RIGHT ANGLE

PART #	PRICE/QTY 1-49	50-99	100-499
R9P	1.60	1.45	1.33
R9S	1.62	1.47	1.35
R15P	1.52	1.38	1.27
R15S	1.54	1.40	1.28
R25P	1.96	1.78	1.63
R25S	1.98	1.80	1.65
R37P	2.94	2.67	2.45
R37S	2.98	2.71	2.48

(E) IDD DIP PLUG CONNECTORS

PART #	PRICE/QTY 1-49	50-99	100-499
IDD14	0.85	0.77	0.71
IDD16	0.95	0.86	0.79
IDD24	1.65	1.50	1.38
IDD40	2.75	2.50	2.29

(F) IDE EDGECARD CONNECTOR

PART#	PRICE/QTY 1-49	50-99	100-499
IDE10	1.30	1.16	1.04
IDE14	1.55	1.38	1.24
IDE20	1.48	1.27	1.11
IDE26	1.67	1.43	1.25
IDE34	2.04	1.75	1.53
IDE40	2.60	2.23	1.95
IDE50	2.97	2.54	2.23

(G) IDS SOCKET CONNECTOR

PART #	PRICE/QTY 1-49	50-99	100-499
IDS10	0.65	0.56	0.49
IDS14	0.74	0.64	0.56
IDS16	0.88	0.75	0.66
IDS20	0.93	0.79	0.70
IDS26	1.21	1.03	0.91
IDS34	1.58	1.35	1.18
IDS40	1.95	1.67	1.46
IDS50	2.32	1.99	1.74
IDS60	2.78	2.39	2.09

(H) 57 SERIES SOLDER TYPE

PART #	PRICE/QTY 1-49	50-99	100-499
57-24P	3.68	3.35	3.07
57-24S	3.60	3.27	3.00
57-36P	3.00	2.67	2.40
57-36S	3.66	3.33	3.05
57-50P	5.12	4.65	4.27
57-50S	5.92	5.38	4.93

(I) 57 SERIES RIBBON CABLE TYPE

PART #	PRICE/QTY 1-49	50-99	100-499
ID57-24P	5.00	4.62	4.29
ID57-24S	5.50	5.08	4.71
ID57-36P	4.25	3.78	3.40
ID57-36S	5.50	5.00	4.58
ID57-50P	8.03	7.42	6.89
ID57-50S	7.52	6.94	6.44

(J) BREAKAWAY HEADER STRIPS STRAIGHT

PART #	PRICE/QTY 1-49	50-99	100-499
IDH10B	0.28	0.25	0.23
IDH14B	0.39	0.35	0.32
IDH16B	0.44	0.40	0.37
IDH20B	0.55	0.50	0.46
IDH26B	0.72	0.65	0.60
IDH34B	0.94	0.85	0.78
IDH40B	1.10	1.00	0.92
IDH50B	1.38	1.25	1.15

(K) BREAKAWAY HEADER STRIPS RIGHT ANGLE

PART #	PRICE/QTY 1-49	50-99	100-499
IDH10BR	0.36	0.33	0.30
IDH14BR	0.51	0.46	0.42
IDH16BR	0.58	0.53	0.48
IDH20BR	0.73	0.66	0.60
IDH26BR	0.94	0.86	0.79
IDH34BR	1.23	1.12	1.03
IDH40BR	1.45	1.32	1.21
IDH50BR	1.81	1.65	1.51

EMPTY CRIMP SHELLS

PART #	PRICE/QTY 1-49	50-99	100-499
C9P	0.70	0.46	0.32
C9S	0.70	0.48	0.34
C15P	0.73	0.52	0.36
C15S	0.73	0.53	0.37
C25P	0.75	0.54	0.38
C25S	0.75	0.57	0.40
C37P	0.96	0.87	0.80
C37S	1.00	0.91	0.83
C50P	1.12	1.02	0.93
C50S	1.14	1.04	0.95

CRIMP CONTACTS

PART #	PRICE/QTY 1-99	100-999	1K-4999
CP20P	0.080	0.043	0.038
CP20S	0.100	0.054	0.048

MACHINED CONTACTS

PART #	PRICE/QTY 1-99	100-999	1K-4999
MCP20P	0.18	0.140	0.110
MCP20S	0.20	0.160	0.125

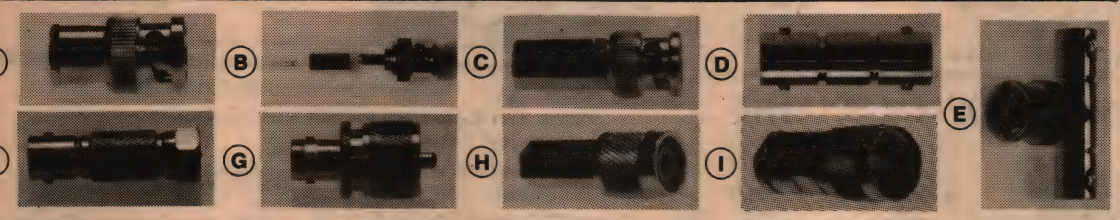
CABLE TOOLS
(For the 'Do-It-Yourselfers'!)

Extractor Tool
Removes crimp contacts (Inserts also.)
EXT-1 **$2.75**

CRIMPING TOOL
Professional ratchet
type CT-1645 **$79.95**

PALADIN MAXI-CRIMPER
Professional ratcheted crimp tool. Crimps RG58, 59 and 62 AU, BNC, TNC connectors. PA1317 **$36.95**

COAXIAL CABLE CONNECTORS AND ADAPTERS



(A) BNC CONNECTORS SOLDER TYPE

PART #	DESCRIPTION	PRICES 1-49	50-99	100-499
BNC58S	BNC solder for RG-58	1.95	1.18	0.98
BNC59S	BNC solder for RG-59	1.95	1.18	0.98

(B) CRIMP TYPE

PART #	DESCRIPTION	PRICES 1-49	50-99	100-499
BNC58C	BNC crimp on for RG-58	1.95	1.50	1.25
BNCF58C	Female crimp for RG-58	1.95	1.40	1.17
BNC59C	BNC crimp on for RG-59	1.95	1.30	1.08
BNCF59C	Female crimp for RG-59	1.95	1.50	1.25
BNC174C	BNC male crimp for RG174	1.95	1.50	1.25

(C) BNC TWIST-ON

PART #	DESCRIPTION	PRICES 1-49	50-99	100-499
BNC-T059	BNC twist on for RG-59 & 62	1.63	1.30	1.08
BNC-T058	BNC twist on for RG-58	2.08	1.92	1.79

(D)(E) BNC ADAPTER'S

PART #	DESCRIPTION	PRICES 1-24	25-49	50-UP
BNC-T	BNC "T" adapter	2.75	2.18	1.82
BNC-FS	BNC female inline splice	1.65	1.30	1.08
BNC-MS	BNC male inline splice	1.95	1.64	1.37
BNC-CMFT	BNC chassis mount feed thru	3.25	2.60	2.17
BNC-BR	BNC bulkhead receptacle	1.50	1.14	0.95
BNC-RA	BNC right angle adapter	2.75	2.08	1.73
BNC-58T	50 ohm terminator	2.95	2.69	2.50
BNC-59T	75 ohm terminator	2.95	2.69	2.50

(F)(G) COAXIAL CONNECTOR ADAPTERS

PART #	DESCRIPTION	PRICES 1-24	25-49	50-UP
F-BNC	F female to BNC male	1.95	1.50	1.20
BNC-F	BNC female to F male	1.75	1.38	1.10
RCA-BNC	RCA female to BNC male	1.75	1.23	0.98
BNC-RCA	BNC female to RCA male	1.75	1.23	0.98
F-RCA	F female to RCA male	1.75	1.23	0.98
RCA-F	RCA female to F male	1.75	1.25	1.00
RCA-UHF	RCA female to UHF male	1.75	1.25	1.00
BNC-UHF	BNC female to UHF male	2.50	1.90	1.52
UHF-BNC	UHF female to BNC male	2.50	1.88	1.50
F-UHF	F female to UHF male	1.95	1.50	1.20
UHF-F	UHF female to F male	1.75	1.33	1.06

(H) TNC CONNECTORS

PART #	DESCRIPTION	PRICES 1-24	25-49	50-UP
TNC-59C	TNC male crimp for RG-59	2.50	2.00	1.82
TNC-58C	TNC male crimp for RG-58	2.95	2.40	2.18
TNC-T059	TNC twist on for RG-59, 62	3.95	3.20	2.91
TNC-T058	TNC twist on for RG-58	3.95	3.20	2.91
TNC-IS	TNC inline splice	4.25	3.50	3.18
TNC-RA	TNC right angle	7.50	6.00	5.45

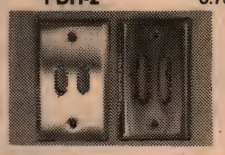
(I) TWIN-AX CONNECTORS

PART #	DESCRIPTION	PRICES 1-24	25-49	50-UP
TWX-MC	Male twinax connector	6.00	5.54	5.14
TWX-FIA	Female inline adapter	6.00	5.54	5.14
TWX-CM	Female bulkhead receptical	10.00	9.23	8.57
TWX-T	Twinax "T" adaptor	11.95	9.23	8.57

HARDWARE

D-SERIES HARDWARE

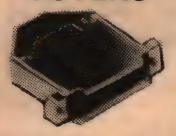
PART#	PRICE/QTY 1-49	50-99	100-499
MDH-1	0.55	0.36	0.30
FDH-2	0.75	0.56	0.46



RS-232 WALL PLATES

PART#	PRICE/QTY 1-9	10-24	25-49
WP9-1, WP15-1, WP25-1	1.88	1.36	1.25
WP9-2, WP15-2, WP25-2	2.13	1.55	1.42

HOODS AND COVERS

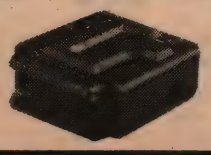


SHIELDED HOODS

PART #	PRICE/QTY 1-49	50-99	100-499
SH9	0.75	0.64	0.56
SH15	0.76	0.65	0.57
SH25	0.81	0.69	0.61
SH37	1.72	1.56	1.43
SH50	2.37	1.90	1.58

AMP HOOD

PART #	PRICE/QTY 1-49	50-99	100-499
AH25	1.25	1.00	0.83



GREY HOODS

PART #	PRICE/QTY 1-49	50-99	100-499
GH9	0.68	0.47	0.42
GH15	0.80	0.56	0.50
GH25	0.85	0.64	0.58
GH37	1.06	0.96	0.88
GH50	1.10	1.00	0.92

METAL HOODS

PART #	PRICE/QTY 1-49	50-99	100-499
MH9	1.75	1.56	1.40
MH15	2.00	1.78	1.60
MH25	2.13	1.89	1.70

DUAL HOODS

PART #	PRICE/QTY 1-49	50-99	100-499
DH25	1.13	0.90	0.75
DH37	1.17	0.94	0.78

SIDE OR REAR ENTRY HOOD

PART #	PRICE/QTY 1-49	50-99	100-499
SRH-9	1.00	0.80	0.67
SRH-25	1.13	0.90	0.75

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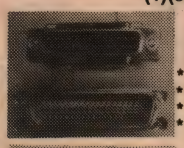
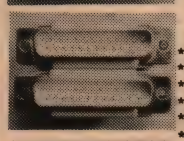
POPULAR CABLE ASSEMBLIES

To order a custom cable, call Toll Free: (1)(800) 531-5369 In Texas (1)(512) 828-0503



IBM PARALLEL PRINTER CABLES

PART #	DESCRIPTION	PRICES
*PPC301-6	6 ft.	10.40
*PPC301-10	10 ft.	12.00
*PPC301-15	15 ft.	19.95
*PPC301-25	25 ft.	24.95



DB25 CABLE ASSEMBLIES

PART #	DESCRIPTION	PRICES
*25MM-6	6 ft. male to male	14.95
*25MM-10	10 ft. male to male	19.95
*25MM-25	25 ft. male to male	24.95
*25MF-6	6 ft. male to female	14.95
*25MF-10	10 ft. male to female	19.95
*25MF-25	25 ft. male to female	24.95

CENTRONICS CABLE ASSEMBLIES
(36 pin male to male)

PART #	DESCRIPTION	PRICES
*36MM-6	6 ft.	14.95
*36MM-10	10 ft.	19.95

COAXIAL CABLES

PART #	DESCRIPTION	PRICES
CC001	Twinax Cables M-M	16.00 + .40 ft.
CC002	Dual Wang Cables	18.00 + .40 ft.
CC003	BNC-BNC RG 59U 6 ft.	5.95

PARALLEL PRINTER CABLES

PART #	DESCRIPTION	PRICES
PPC001	Osborne 1 PPC 26E-36P 6 ft.	18.95
PPC002	Osborne Executive PPC24P-36P 6 ft.	21.00
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PPC004	Laser 128 PPC 15P-36P 6 ft.	21.00
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PPC006	13 Pin Atari Interface Cable 3 ft.	4.95
PPC007	Atari 850 to Parallel Printer 6 ft.	13.13

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PART #	DESCRIPTION	PRICES
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SC002	IBM PC JR to Hayes Modem 6 ft.	16.50
*SC003	**Commodore 6 Pin Din M-M 3 ft.**	3.95
SC004	IBM PC to HP Laser Jet 6 ft. Serial	16.95
SC005	IBM PC to Diablo 620 Serial 6 ft.	16.95
SC006	IBM PC to Diablo 630 Serial 6 ft.	16.95
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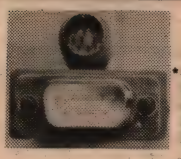
(With male and female 24 pin Centronics connector on each end)

PART #	DESCRIPTION	PRICES
*IEEE488-1M	1 meter long	36.95
*IEEE488-2M	2 meters long	39.95
*IEEE488-4M	4 meters long	43.95



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AP2E-2	Apple IIe to ImageWriter II, 6 ft.	12.95
AP2C-2	Apple IIc to ImageWriter II, 6 ft.	12.95
APMC+-2	Macintosh+ to ImageWriter II, 6 ft.	12.95
APMC+-H	Macintosh+ to Hayes Modem, 6 ft.	12.95

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PCCA002	IDS-26 — IDC-25S (Parallel Port)	6.69 + .30 ft.
PCCA003	IDS-26 — IDC-25P (Serial Port)	6.69 + .30 ft.
PCCA004	2nd Serial Port Cables (Half Card)	12.00

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(IBM or Clone)

PART #	DESCRIPTION	PRICES
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DDC-22	Dual Floppy Cable	6.95
HDC-22	Hard Drive Cables	7.95

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(IBM or Clone)

PART #	DESCRIPTION	PRICES
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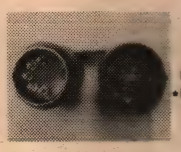
VMC-6	RCA to RCA 6 ft	1.95
MCA003	Composite Monitor Cable 6 ft. (9P-RCA)	6.95
MCA004	IBM PC RGB Monitor Cable 6 ft. (9P-8 Pin Rect.)	9.13
*5P-4RCA	5 Pin Din to 4 RCA Connector for Commodore, TI, Atari, etc., to composite monitor, 6 ft.	3.60



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(IBM or Clone)

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ACPC003	Monitor AC Adaptor	5.95

Photos shown depict both ends of cable assemblies. Not all cables are shown; asterisk indicate those that are.

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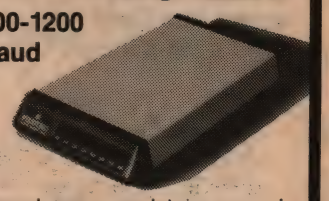

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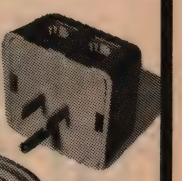

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9S-9S	9 pin female to female	6.08 + .18 per ft.
15P-15P	15 pin male to male	7.44 + .30 per ft.
15P-15S	15 pin male to female	7.62 + .30 per ft.
15S-15S	15 pin female to female	7.80 + .30 per ft.
25P-25P	25 pin male to male	8.96 + .50 per ft.
25P-25S	25 pin male to female	9.62 + .50 per ft.
25S-25S	25 pin female to female	10.28 + .50 per ft.
37P-37P	37 pin male to male	11.40 + .74 per ft.
37P-37S	37 pin male to female	12.46 + .74 per ft.
37S-37S	37 pin female to female	13.52 + .74 per ft.
50P-50P	50 pin male to male	25.96 + 1.00 per ft.
50P-50S	50 pin male to female	27.45 + 1.00 per ft.
50S-50S	50 pin female to female	28.94 + 1.00 per ft.

57 SERIES RIBBON CABLE ASSEMBLIES

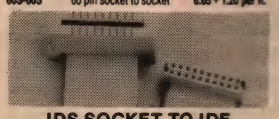
PART #	DESCRIPTION	PRICE
5724P-P	24 pin male to male	10.00 + .48 per ft.
5724P-S	24 pin male to female	10.50 + .48 per ft.
5724S-S	24 pin female to female	11.00 + .48 per ft.
5736P-P	36 pin male to male	8.00 + .72 per ft.
5736P-S	36 pin male to female	10.00 + .72 per ft.
5736S-S	36 pin female to female	12.00 + .72 per ft.
5750P-P	50 pin male to male	18.75 + 1.00 per ft.
5750P-S	50 pin male to female	16.25 + 1.00 per ft.
5750S-S	50 pin female to female	15.75 + 1.00 per ft.

IDE EDGECARD TO IDE EDGCARD

PART #	DESCRIPTION	PRICE
10E-10E	10 pin edg.crd. to edg.crd.	3.80 + .20 per ft.
14E-14E	14 pin edg.crd. to edg.crd.	4.00 + .28 per ft.
20E-20E	20 pin edg.crd. to edg.crd.	4.50 + .40 per ft.
26E-26E	26 pin edg.crd. to edg.crd.	5.30 + .52 per ft.
34E-34E	34 pin edg.crd. to edg.crd.	5.90 + .68 per ft.
40E-40E	40 pin edg.crd. to edg.crd.	7.80 + .80 per ft.
50E-50E	50 pin edg.crd. to edg.crd.	8.50 + 1.00 per ft.

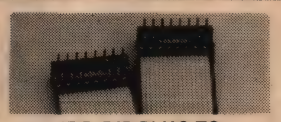
IDS SOCKET TO IDS SOCKET

PART #	DESCRIPTION	PRICE
10S-10S	10 pin socket to socket	2.00 + .20 per ft.
14S-14S	14 pin socket to socket	2.50 + .28 per ft.
16S-16S	16 pin socket to socket	2.75 + .32 per ft.
20S-20S	20 pin socket to socket	2.85 + .40 per ft.
26S-26S	26 pin socket to socket	3.50 + .52 per ft.
34S-34S	34 pin socket to socket	4.10 + .68 per ft.
40S-40S	40 pin socket to socket	4.50 + .80 per ft.
50S-50S	50 pin socket to socket	6.15 + 1.00 per ft.
60S-60S	60 pin socket to socket	6.65 + 1.20 per ft.



IDS SOCKET TO IDE EDGCARD

PART #	DESCRIPTION	PRICE
10S-10E	10 pin socket to edg.crd.	3.20 + .20 per ft.
14S-14E	14 pin socket to edg.crd.	3.50 + .28 per ft.
20S-20E	20 pin socket to edg.crd.	3.75 + .40 per ft.
26S-26E	26 pin socket to edg.crd.	4.75 + .52 per ft.
34S-34E	34 pin socket to edg.crd.	5.40 + .68 per ft.
40S-40E	40 pin socket to edg.crd.	6.45 + .80 per ft.
50S-50E	50 pin socket to edg.crd.	7.85 + 1.00 per ft.



IDD DIP PLUG TO IDD DIP PLUG

PART #	DESCRIPTION	PRICE
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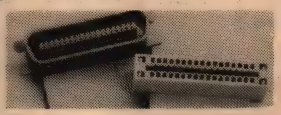
16D-16D	16 pin dip plug cable	2.75 + .32 per ft.
24D-24D	24 pin dip plug cable	3.75 + .48 per ft.
40D-40D	40 pin dip plug cable	7.50 + .80 per ft.



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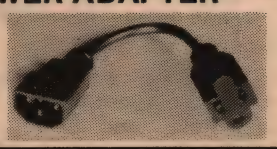

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Rumors End
continued from page 123

who are offering software that should run on the C-128. Excaliber is communications program that is being sold as a C-128 CP/M program by Niagara Communications. They've been running a small ad in *Computer Shopper* for awhile, but in case you might have missed it, I thought I'd mention it here. It's $49.95. As usual the address is at the end of this article.

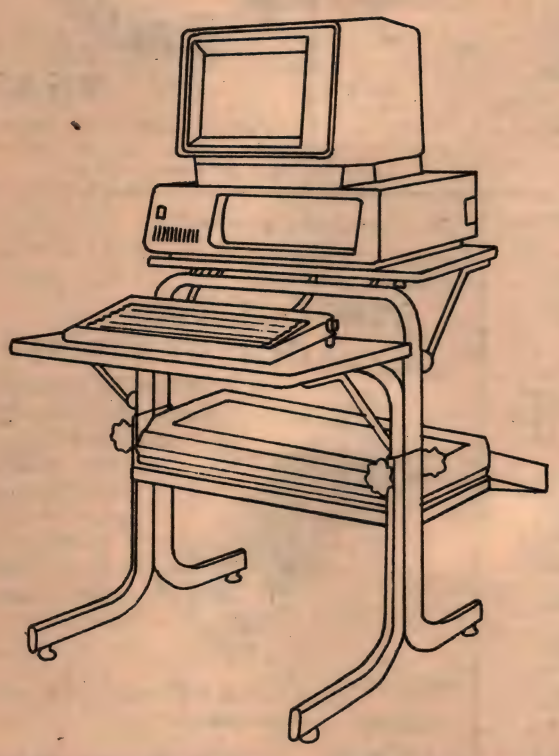
Roy Lipscomb of Logic Associates wrote to tell me that they are offering software in CP/M format. His company offers a free catalog and reviews of their software. He suggests that C-128 users order the Kaypro II or IV format.

Getting The Most
continued from page 124

add footnote capability, I am fairly confident that a home or college user will not outgrow them. The one weak link in these programs is the glacial slowness of Data Manager 128. I can help you speed it up and will make a few suggestions for future improvements to Timeworks next month when I tell you how to get the most from Data Manager 128.

I use several word processors on several machines so I don't try to remember all the various commands. I have often wondered why companies don't list the commands according to what needs to be done instead of what the command is to do it. Because of this, I make a list of commands as I study each new word processor. That makes it easy to look up what I want to do later. By the time I finish these commands, I have the program under control. ●

COMPUTER TABLE FOR HOME OR OFFICE



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Though I have not tried the programs, I will briefly describe them for the adventurous. They offer Columns, a program to manipulate text, similar to the page layout software that is offered with some of the desktop publishing packages. It offers cut-and-paste to move the text around. Price is $29.

Diskguise is a file handling routine that gives more flexibility to CP/M. Price is $32. Supermit adds flexibility to BATCH jobs. If you don't know how to use BATCH commands, this one won't mean much to you. Price is $39. Look for the ads in *Computer Shopper* for full descriptions of these.

The one that looked most useful to me, was the VersBase program. It asks for a number whenever a program is about to create a new version. If you answer yes, it will append the next highest version number to the file. For someone like me who goes through 5 or 6 copies when creating a file, this would be ideal. Price is $32

As usual *Computer Shopper* has forwarded my mail and I've had several interesting letters. This one has a problem I think I can help with.

Dear Ms. Peterson,

I would like to thank you for your C-128 CP/M column. I have been reading it since it started. Before I was a bit nervous about using CP/M and had little interest in CP/M so I didn't read very much of the 128 System Guide on CP/M. Your articles informed me that my 128 will run other formats such as Kaypro IV. Upon reading this I contacted a friend who is the head of programming at a realty company. He had made me an offer of free software when I bought my 128, but I turned it down because it was for Kaypro IV. The software was available because his company would write its own packages for its realtors on the Kaypro and did not want to give them the bonus package they received when they bought the Kaypro IV's. This package included WordStar, MailMerge, Word Plus, Microsoft BASIC-80, DataStar, ReportStar, CalcStar, and the main reason for this letter dBase II. I thought you might be interested in this after your articles in August and September and might want to pass it on to others. I called a couple of local Kaypro dealers and found out that dBase II is still available for Kaypro IV in CP/M for about $90.

I also have two questions for you, first when I try to make a working copy of these disks I cannot because PIP is not on these disks and when I use a command such as PIP E: = A:DBASE.COM it looks for the file on that disk. Any help would be appreciated. Second, how good is the documentation for the CP/M package that is offered in the Commodore 128 System Guide (found between 220 and 221) and would this possibly answer the first question?

Sincerely,
Robert E. Codd II

Thanks for writing Robert. I think I can help with your problem, but first I'd like to make a comment. I'm glad you turned down the offer of "free software." While the reason you gave in the letter was acceptable, I would have been a lot happier to hear you turned it down because it would also have been "illegal software." As you appear to have bought a legal copy of dBase II, I will spare you the lecture on software piracy and just answer the question.

Your PIP problem seems strange to me. Before trying to PIP the files, be sure you have a copy of PIP.COM on the destination disk. Put the destination disk in the drive and type your PIP command. You may need to type E:PIP E: = A:DBASE.COM. The disk drive should whirr a second or two and then the computer should prompt you to remove the E: disk and insert the A: disk. From there it should prompt you to switch disks a couple times. It should give you back the A > prompt when you are done.

The Digital Research Manual does have a lot of information and probably would answer your question. But there are less expensive ways to get an answer. If you are interested in really finding out how CP/M works, the Digital Research book may be the best way to go for you. (I understand from a source at Commodore that it has sold over 50,000 copies.)

Hope this helps you.

Regards from a previous writer Ted Chidester wrote several months ago looking for a recommendation of a good COBOL compiler. He writes again with further information on what he has found.

Cheryl,

The inquiry I sent you was part of a BATCH (inquiry about COBOL). Strangely, of the many possibilities, most

continued on page 280

Wanderer
continued from page 273

undetailed shapes, but they move about the screen in all directions, toward and away from you, with outstanding three-dimensional realism. Shoot an object and you might find yourself ducking your head to avoid the oncoming debris.

The game uses shields, energy, and a sector map, much like the popular Star Raiders program for the 8-bit Atari. But the playing card concept is completely unique to Wanderer. By exchanging cards among the planets, you attempt to better the hands for payment in cats. Helping a planet gain a pair, for example, is worth 50 points; three of a kind is worth 300 cats; poker is worth 3000 cats; with a number of other combinations in-between. Again, it's silly stuff, but the game is very playable, aided enormously by the 3D graphics.

Seeing The 3D

Wanderer can only be played in 3D, since it looks like a tangled mesh of red and blue lines without the glasses. But some individuals will have trouble seeing the 3D, and others might not see it at all. The instruction manual gives a variety of tips for seeing the 3D best, such as turning up the contrast and darkening the room. Your enjoyment of the game will depend largely upon how well you can see the 3D.

The fourteen-page documentation booklet contains ample instructions, and includes a section that explains how the 3D effect is created. The language is at times awkward and confusing, since it was apparently translated, but on the whole the instructions are detailed enough to be understandable.

Conclusions

Without a doubt, Wanderer's 3D effects are what makes the game interesting and enjoyable. The game really shows off the high-speed computation capabilities of the ST, particularly when numerous objects are flying around the screen at once, all in 3D. The novelty of the 3D graphics will diminish each time you play the game, of course, but it's still nice to have at least one 3D game in your software library to show off.

Requires: Atari 520/1040ST, Disk Drive, Joystick.

Authors: Beatrice, Jean-Luc and Frederic Langlois.

Distributed by: Eidersoft, USA, P.O. Box 5607, Glendale, AZ 85312-5607.

Ratings For Wanderer: * Poor, ** Fair, *** Good, **** Excellent.

Program Design ***
Playability ***
Documentation ***
Average ***

Inside Commodore continued from page 123

And keeping track of all the cross-referenced addresses, and data tables in a program, can be a rather tedious job. If you want to modify the original program, you'll also have to re-key in all the source code over again, after you've successfully re-created its listing. A good symbolic disassembler like Symbol Master helps to avoid all this trouble.

For one thing, Symbol Master will allow for symbols for all program references. This means entry and exit points, subroutines, branches, and data tables can all be referenced by symbolic names instead of absolute addresses. You can specify the labels for different addresses or let Symbol Master generate it's own specially coded symbols (which you can later change when you want). When Symbol Master then runs across a reference to that address again, somewhere else in the program it will then insert the defined symbolic label instead of the absolute address.

Here's a quick example of how powerful this feature is: Say you are disassembling a program that makes extensive use of the Commodore KERNAL ROM. Symbol Master comes with a symbol table file with all the KERNAL jump table address and labels already listed in it (you can create others also). Before disassembling the program, you first load in the KERNAL symbol table file. Then, when generating the disassembled program listing, and the program does a JSR $FFD2, you would see a listing of JSR CHROUT instead. This makes the listing much more readable and understandable. The analysis procedure is greatly speeded up.

But this is just a small taste of what Symbol Master is capable of. In addition, you can generate disk file listings that are complete source code re-creations of the original program. You can then modify these listings and re-assemble with your own assembler. Symbol Master will disassemble into most Commodore compatible assembler formats. These include PAL, LADS, MADS (Commodore's C-64 Macro Assembler), Merlin, and MAE (among others).

Included on the same Symbol Master program disk (which is unprotected by the way) are several different versions of Symbol Master, including both C-64 and native C-128 versions. Also included are some utility programs, like a special version of Micromon that integrates perfectly with Symbol Master. The C-128 versions will disassemble both C-128 software and C-64 programs, which conjurs up some interesting possibilities for software analysis that are best left to reader's imaginations.

I find that this program is more than just a handy programmer's aid. Properly used, it is a very educational tool and unmatched by simpler monitor disassemblers. If you are into 6502 assembly language on any level other than rank beginner, you'll find Symbol Master well worth its $49.95 price. While it takes a while to learn to use the program effectively, its 63 page manual documents the program sufficiently. It's not for the absolute novice, but is a real gold mine for the experienced ML programmer. The complete ordering address is at the end of the article.

We'll be back next month with more software and hardware reviews. In upcoming columns, look for more info on GEOS, a look at Schnedler Systems' VIA adapter boards, and other Commodore topics. Until then...happy computing!

Products Mentioned In This Column

Product: *GEOS Programmer's Reference Guide*
Price: $15.00 (approx.—write author for more info.)
Supplier: Alexander D. Boyce, 2269 Grandview Ave., Apt. 1, Cleveland Heights, OH 44106-3144.

Product: *The OFFICIAL GEOS Programmer's Reference Guide*
Price: $19.95
Supplier: Bantam Books, 666 Fifth Ave., New York, NY 10103

Product: Symbol Master Symbolic Disassembler
Price: $49.95
Supplier: Schnedler Systems, 1501 N. Ivanhoe St., Arlington, VA 22205; (703) 237-4796. ●

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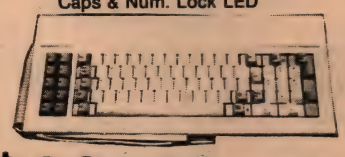

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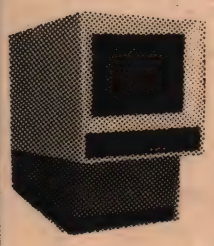

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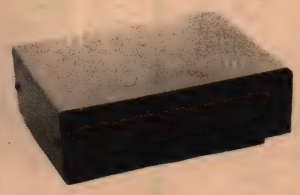

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Amiga—The Structure
continued from page 127

March came in like a fox, roaring over the frozen tundra, guns blazing and missiles whizzing through the air as we battled aliens for possession of the polar region in a super tank called Artic Fox.

To Arctic Fox goes the distinction of being the first commercially available game to be created specifically for the Amiga and while it is a very playable game that combines the need for both strategy and arcade skills, it could well have been created simply to show off the features of the computer.

Scrolling from one vista to another is so smooth that you tend to believe you are driving around a continous battlefield; 3-D effects allow the enemy to hide behind terrain features (and allow you to peek behind them with seeing-eye missiles that are guided by hand); stereo sound gives you explosions of course, but also more subtle noises such as your treads swishing on ice, the straining of the motor as you mount an obstacle, the crack of lightning and the rumble of thunder as an electrical storm blinds your radar.

(There was a serious contender to Arctic Fox in Aegis Animator. With Animator, images could be created and moved about the screen, sized, rotated in three dimensions, cloned, moved to background or foreground. With the addition of text in several fonts and the ability to "storyboard" sequences for consecutive playback, it entered the field as a powerful product that is a must-have for anyone involved with the presentation of ideas in graphic form. And because it made use of the IFF format, graphics created with Deluxe Paint and Aegis Images could be shared by Animator.)

April brought Transformer, from Commodore Business Machines and at last the question of the Amiga as a productivity computer was answered in spades. Transformer, and the 5.25 inch disk drive with which it is bundled, causes the Amiga to emulate an IBM PC computer, not in it's entirety but at least insofar as the most popular MSDOS productivity packages are concerned.

These include such high-powered best sellers as Lotus 1,2,3, dBase III, Multiplan, WordPerfect, IBM Writing Assistant, PFS File, MultiMate and more.

That it was released in April, midway through the first year of the Amiga is probably a coincidence, but the release date enhances the image of Transformer as a watershed. Never again could critics of the Amiga truthfully moan about a lack of serious productivity software, for Transformer opened the machine to the world's best.

(Though Commodore eclipsed Transformer in the same month with an announcement of Sidecar, Transformer is available; does the job for which it was intended; and costs about half the projected price of Sidecar.)

To make April even better, Commodore sponsored a price promotion by supplying the Amiga monitor free with each computer. In their advertising, they suggested the $500 saved be invested in software and things were looking up because you really could buy that much software and have no duplications.

For tracking finances, Rags to Riches, Financial Cookbook and Financial Plus had been ported from MSDOS; in games we had Archon, One on One, Seven Cities of Gold, Mindshadow, Hacker, Borrowed Time, The Halley Project, Golden Oldies, Monkey Business, Delta Patrol, Brataccas, Racter; Aegis Images and Graphicraft were available for drawing and painting; for telecommunications, there were Online and MaxiCom as well as a host of public domain routines; Scribble and Write Hand added a choice in word processors (Flow allowed the processing of ideas) while Analyze and Unicalc became the first available spreadsheets. Databases available by this time were MiAmiga File and Infobase. Educational software had also appeared in the form of KidTalk (to teach composition), Speller Bee (for spelling drills in game form) and Discovery which was available in both math and spelling versions. And for composers there was Music Studio.

Not far into the future were Marble Madness, Archon II, Adventure Construction Set, Little Computer People, Instant Music, Super Huey and more.

And if you think April was great, take a look at May; In May, VIP Professional appeared on dealer shelves. VIP can best be described as a clone of Lotus 1, 2, 3, the most popular spreadsheet ever published. VIP is so close to Lotus that any of the many books written on Lotus applications can be applied to VIP, right down to the last keystroke.

And VIP goes on from there to add an auxiliary program called GraphPrint, for the creation of business graphs in sixteen colors and able to use all the Amiga Notepad fonts.

It becomes a milestone by virture of its improvements on the original, putting all this is on a single disk (compared to the four disks required to set up and run Lotus) and at a fraction of the price.

In June, we were privileged, to see Deluxe Print from Electronic Arts. While the idea of a program for creating signs,

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Rumors End
continued from page 278

often mentioned was Chuck Ellis and his Nevada COBOL...and I had already tried that source. It so happens (in COBOL, at least) that the number of Reserved Words is an accurate measure of the completeness of the particular compiler or interpreter and a quick evaluation comes from merely asking, "How many?" Though I may never finish it, a COBOL interpreter which I've had "in progress" for about eighteen months recognizes 323. I think Ellis answered, "one hundred twenty." To write one of the nutty things (an interpreter) including the ML segments required by certain speed demands is an awesome chore and my problem arose from a need to write some COBOL coupled with the recognition that my own interpreter is probably years from completion. Its priority is low and its progress slow since I own and operate apartments, maintain five vehicles, do a little construction and goof off some. Mainly I'm self-taught, and since I've wasted the time and money to experiment with many texts covering all phases I've explored...I'll pass along the info that the *Self Teaching Guides* from John Wiley & Sons, Inc. are consistently "head and shoulders" above the rest. They seem to have an adequate, understandable text on any computer topic that could interest a reader. 'Nuff for now. Over, ... and, ... Out ...

Best regards,
Ted Chidester

P.S. I'm using the Abacus COBOL —about 105 reserved words, and it hammers the 1571 "read" head. I'm planning on the Digital Research version for $1500.

It's always nice to get a reply from a reader. It's nice to know that they do see the responses we print. I hope when Mr. Chidester finishes his COBOL, he'll let me know so we can feature details here in the column.

Next month we'll look at some more letters that have come in and see what other CP/M users have discovered.

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"Upon this rock"....Matt. 16:18

Amiga—The Structure continued from page 280

greeting cards and banners was not new, the execution of Print places it head and shoulders above everything that has gone before.

In Print, you have before you at all times a picture of the finished product, allowing you to add, take away, move, rotate or resize any of the elements used, to arrive at the most dynamic composition with a minimum of false moves.

Add to this the ability to size the final product (shrink a sign to a bookmark; enlarge a label to a letterhead); and to print in color on any of the several color printers supported by Preferences (and to also do a better-than-average printout in black and white) and you have not only the first printing program for the Amiga but also the best printing program available for any computer.

It was only June: nine months into the life of the Amiga. With less than a year on the market the available library of applications was broader than for any other new computer in a similar length of time. And now things began stacking up, for July furnished two milestones: one a new product and one a new expression of an older idea.

The new expression was in the form of Aegis Draw, the first Computer Aided Design (CAD) program for the Amiga. In being the first it set a high mark for which other CAD packages must aim and it set a new standard in affordable prices for such software.

Previously, for MSDOS computers, programs with the capabilities of Draw had cost upwards of two thousand dollars. Draw was brought to market at a tenth of that price and offers features such as the ability to create a shape and then move it, much as windows are moved in Workbench; it allows drawings to be done in as many as 256 layers and gives the user the ability to edit the layers independent of one another; allows zooming in on tiny parts of the drawing while preserving all the fine detail; and allows the use of multiple windows for working on several drawings or on several versions of one drawing.

With a single stroke, Aegis had caused the Amiga to become a competitor in the single most sophisticated arena of computer graphics: CAD. And before the month was over, Electronic Arts would cause the computer to challenge an entirely different field.

With Deluxe Video, you work with a storyboard that allows you to place images within a particular timeframe; to do fade-ins, fade-outs, cuts, dissolves and more; to move the images to any place on the screen in real-time animation; to combine these with other images and with sound—and the result can be as good as some of the animated videos seen on television.

Even more, the short videos you create can be linked to form longer pieces; can be played as a loop for continous showing; and can be installed on "run-time" disks so that they may be played back on any 512K Amiga, regardless of whether the Deluxe Video program is installed.

With Deluxe Video, and with the ability to transfer your creations to videotape, the small business need no longer go to professional production houses for the creation of TV advertising and those who make home movies on videotape can now produce professional-looking titles, credits—even sequences to bridge the gap between the beach vacation in '82 and Christmas '84.

In choosing a milestone for July, we consider both Draw and Video to be winners: both redefine the Amiga; both extend the possibilities for productivity. And both programs, as does Deluxe Print, support, the IFF format for storing images.

In addition to all the other "firsts," Amiga and IFF gives us the ability to swap graphic information not only between programs from one producer, but between competing programs from different producers. The result is a greater cohesiveness and flexibility than any other computer can offer.

July also brought Mind Walker, deserving of mention because it combines graphics, sound and animation in ways that make it difficult to decide whether it is a game or an art form and because it is here that a curious reversal begins: While new applications still redefine the Amiga, the capabilities of the Amiga begin to redefine applications. As the first expression of this, Mind Walker may someday be the archetypal computer game.

And in conformity to this theme, Infominder from Byte by Byte Software dominates the August software releases. Not only does it redefine the Amiga; it redefines the database and permits filing of both text and graphics.

Using the hierarchical format of menus, submenus and sub-submenus, Infominder is completely mouse-driven. Click on a menu item and it "expands" to show you the submenus. Never do you have to touch the keyboard, except in creating your files.

As an example of how information is handled, the working disk contains a category called Fun and Games. Among the submenus is one called Bay Area Dining and subordinate to this is a listing of types of restaurants—Chinese, Korean, Italian, Mexican and so forth. Each item in this menu is also a submenu and clicking on one will further open the category to show names and addresses of the restaurants as well as comments from those who have dined there.

It is also a program for which users are invited to develop new uses and distribute freely or, if commercial distribution is the goal, pay a token licensing fee.

We can imagine a disk based on first aid, where the category of the injury (cut, burn, break, strain) could be clicked on, leading to a submenu of bodily areas which in turn could lead to text describing the first aid steps to follow (as well as precautions and no-nos) and even include diagrams showing proper compress or bandaging methods.

Not that any of us would run to the computer when the child came into the house with a gashed elbow; but for the operators of "hot-line" operations or outpatient emergency rooms, it could be a most valuable aid and reference tool.

Like the Amiga itself, it will be a long time before all the possibilities of Infominder are explored.

For the September entry, we have Impact from Aegis Development. Impact offers an easy method of creating charts and graphs for business. Though this can be done on certain other painting programs for the Amiga, this is the only purpose of Impact and for that reason several new and specific tools have been included to make the job easier, including the ability to link images for video presentations or to print them as color handouts for a board meeting.

In October, truly powerful database managers moved from the category of vaporware to . . . whatever we call it when a product is on dealers shelves. First there was Organize! from Micro-Systems software. Reasonably priced, it weighs in as a middleweight database, suitable for homes and small business use. In addition to being able to handle up to four billion records, Organize! allows you to create a report—normally the most difficult area of work in a database—by dragging fields around with the mouse.

Superbase Personal also appeared, courtesy of Progressive Peripherals and Software. With it's ability to generate reports by using information from more than one file, it becomes the first relational database for the Amiga. Not content with that, it builds on the Infominder concept in

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Trackstar
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to allow room to run the cable through without pinching. The outboard end of the cable has a connector that will accept the monitor's plug. The other end plugs into the RGB connector in the back of the 1000. Provision is made for both RGB and composite monitor cable connections and both types of cables are supplied with the hardware. Use the screw that holds the board's bracket to the case to connect the ground eyelet on the RGB cable. Be sure the metal shield on the cable is in contact with the bracket where the cable passes through the case. The cable from the monitor plugs into the top connector of the Trackstar board from the rear of the computer.

The only part of the installation that may bother some is required only if you have Teac drives. Each drive must have a capacitor installed to allow Apple diskettes to boot. It isn't much of a chore and anyone that can read pin numbers and find the model numbers on the drive will have no problems. The capacitors install between two of the Test Pins on the drive. Which two will depend on which model drives you have. The model numbers can be found on the rear of the drives. Decide which pins to use and simply slide the capacitor on the pins. No soldering necessary. The capacitors are another indicator of the quality Diamond has put in this package. They could have saved the difference between the soldier type capacitors and the ones they put in the Trackstar and no one would have said a word. After all, you expect a little soldering on an installation like this, don't you? You will have to remove the drives from the chassis but that is simple to accomplish. Once the drives are finished the installation is complete.

The next step is to prepare the diskettes for use. Since the disks are copy protected and do not contain the MSDOS system files you will need to transfer your DOS files to the Trackstar disk. Do not do this before you install the board as the board is used as part of the procedure. Boot your system with your DOS and place the Trackstar disk in drive A. Type SYSCOPY and follow the prompts that appear on the screen. When you are through the Trackstar disk will contain the necessary system files and will be bootable.

To initialize the board you can either boot the Trackstar disk already prepared as in the last paragraph or by typing STAR if the computer is already booted. Once the menu appears you are given two options, Normal Initialization or High Compatibility Initialization. If the high compatibility option is chosen you will need an Apple DOS 3.3 Master disk. The high compatibility option replaces the FPBASIC emulation program with the FPBASIC from the Apple disk. This seems to be the preferred option.

Trackstar has a help option that is called up by using F1 followed by the ESC key. This presents a menu that allows seven options: Reset Trackstar, Reboot the disk, Display/Modify Function Keys, Apple II+ Mode Disable, Other Control Keys, Exit to MSDOS and Return to Trackstar. The Reset option emulates the Control-Reset combination on the IIe and the Reboot option does the same for the <Control><Open-Apple><Reset> combination. The Function Keys option allows the user to emulate specific commands as necessary. The Apple II+ enable/-disable is used when the high compatibility option is used. Some programs use abnormal monitor entries that will run only when the Apple II+ mode is enabled. The other control keys option displays the functions of the F2 (monitor color/mono toggle), F9 (<Open-Apple> emulation or button number 0 on the game port), F10 (<Solid Apple> or button number 1 on the game port) and ALT-ESC (Switches between Apple DOS and MSDOS).

Once the Trackstar is activated you will be told to place the Apple disk in the drive and off you go! That is all there is to it. No fancy commands, no mystery and no problems.

Does it work? Beyond anything I expected! As a matter of fact I prefer some of the programs on the 1000 to the same program on the Apple. The graphics are noticeably faster. Most of the problems encountered were tracked down to the old Apple that we used to copy the disks in my lab. Once the drives were aligned the problems disappeared. Some of the copy protected programs would not run on the Tandy because they use the ½ track protection. The data tracks are shifted by a half a track and the Tandy drives can't handle them. Install an Apple drive and the problem ceases to exist. My Apple software library is limited so I am somewhat stymied in running a large scale test. I suspect that the 99.9% compatibility is somewhat idealistic at this time. Perhaps 90% is more in line. 90%! Why in the name of Pete would I buy something that is only 90%? Not me! Wait a minute.. I am working on a Tandy 1000 that was 90% when I bought it and the only software problems that I have had are so small that I have forgotten what they were. My shelves are lined with IBM software that runs fine on the Tandy. I am sure that there are problems that I haven't run across, but if I haven't found them by now I'm not going to stay awake worrying about where they are. Hardware problems? Yes, but we have worked around them.

The documentation with Trackstar is not impressive. At least not as impressive as I expected for the price. It does cover the installation and the running of the Trackstar but it could use some brushing up. One rough spot is the connection of the drives. I still have not found any place where they tell the installer to re-connect the drives to the motherboard and I'll bet they have had some calls on that one. The documentations cover 43 pages that are the usual ½ page size with about ¼ of these consisting of drawings for the installation. Apparently the manual I have is an update as some of the page references are inaccurate. These are the corrections in the addendum sheet mentioned earlier. I am sure that either an update or a new manual is in the works by now to support this excellent product.

As I mentioned above I called Diamond just before turning this in to *Computer Shopper*. During this call several of my questions were answered. YES, the manual is under revision. There is a reason for the copy protection besides trying to restrict copies of the software (see NOTE mentioned earlier). Watch out for a network version of the Trackstar shortly and Diamond is rightfully proud of this board that was 4½ years in development.

For the most part Trackstar could very well change the outlook of the educational system as to which computers they choose to put in the schools. It is some kind of weird to walk in the lab and see an Apple logo on the Tandy screen. I find no reason why the Trackstar should not fill a slot in the Tandy to produce two computers in one.

There isn't much more that I can say except that I am going to have to have a Trackstar of my own. Unfortunately this one has to go back to Diamond and I will have to get one the old fashioned way. It is worth it!

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the Officer's Manual as well as quick reference card for the Amiga. Obviously, from the sheer weight of the documentation, the authors of the game take it very seriously.

Unfortunately, while much of this reading matter explains the complex controls of the game, a large part of it is devoted to explaining the background of the space war against the Krellian Empire. As with too many recent computer games, this places the weight of the story on the paper rather than on the screen; telling rather than showing.

Though the packaging for StarFleet 1 exerpts what must have been hearty endorsements by other writers, I have to go against the flow. Perhaps because the game was released for almost the entire spectrum of personal computers, there is little here that is Amiga-specific and I found little that was fun or entertaining.

StarFleet 1 is a product of InterStel and is available from them at P.O. Box 57825, Webster, TX 77598 and at a suggested list price of $55.00.

Deep Space

By contrast, Deep Space puts you in the driver's seat of an interstellar space ship and all the action is real and immediate. When you fire a photon torpedo, you see the torpedo racing away from your ship. When you fire pulsars, you see the twin green globes hurl away toward the target and gradually shrink into winking points of light in the deepness of black space.

Employing the best of Amiga graphics, the control panel has working switches to call up radar screens; to switch your field of view; and to arm and fire your weapons or make use of your shields.

The scenario is simple: you're a bounty hunter and your mission is to seek and destroy alien enemies wherever you find them. Bounty is paid immediately upon a kill and it is the same as earning points. In this game, however, the points are used to buy more weapons or more fuel so that you can seek and destroy more of the enemy.

On the ship's console, one switch raises and lowers a six-function screen that can be used as a map of the immediate area; a device for checking your credits and ordering more supplies; a status report on ship's systems, etc. At the other side of the console is a 3-D type map with which you examine a smaller area of which your ship is the center. Near the middle of the console is a control yoke for steering: click it on with the mouse and drag it in the direction you wish to go. Another, smaller console, gives you six buttons that may be used to invoke different weapons, raise and lower your shields, use retro thrust and lock your viewscreen on a specific direction.

The viewscreen itself is filled with stars rushing by you, giving a feeling of movement in space. Some of the colored lights out there are alien vessels, their distance indicated by their color, and others may be meteor showers—which seem frequent.

Space is 3-dimensional. You may turn in any direction as well as go up or down. Aliens may be behind you or above you or both and the maps displayed on your console do their best to convey this fact. One map is an overhead view with your ship at center, while the other is a view from the side, allowing you to see which targets are above or below your field of vision and your ship.

Further, the ship seems to have the mass and momentum properties to be expected in space: you are going "north" and pull your control console hard right; instead of a right-angle turn that would have you heading "east," your forward momentum is still at work and your new path is a vector between the two "directions."

Your weapons at the start are a photon (torpedo) and pulsars. The photon has a long range, but you have only two at the start. Pulsars, on the other hand, seem almost unlimited, but work only when an enemy ship is close enough that you may see its form.

(Enemy ships have a strangely angular form, very unlike the traditional sleek ships of space. Before criticizing these, it is well to remember that streamlining is

continued on page 284

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allowing the filing of graphic images as well.

Flight Simulator II finally appeared, as promised by SubLogic, incorporating some of the new routines which had so teased us in Radar Raiders, and proved to be well worth waiting for.

Not long after this—and before the first full calendar year of the Amiga had ended—there appeared a new form of computer gaming in the person of Defender of the Crown. With animation techniques that had to be seen to be believed, Defender took the computer gaming world by storm. Within six weeks of its release, it had achieved more than 10 per cent saturation—one out of every ten Amiga owners had a copy—and while that number would exceed the hopes of most game developers, Defender is still going strong.

With its first full year a matter of history, the Amiga continues to succeed where so many other new computers have failed. From a box of light and sound, the Amiga has come to be one of the most powerful productivity, art and gaming machines on the market.

The transformation came about because so many software producers saw the computer as an Anything Box and exercised their faith by producing programs that would define it to be what they most wanted it to be. And each time this was done, the moving target that is the Amiga moved a bit more: just when you thought you knew what it was, it changed and became something more, something better than before.

We could trot out the cliches now, such as "The best is yet to come" but you'll have seen that for yourself in such applications as Deluxe Paint II, Deluxe Music Contruction, Strip Poker, World Games, Pagesetter and all the other new titles released at the start of Amiga's second year. And you may even have seen the announcement, shortly after the January Consumer Electronics Show, of the two new Amiga models to be released this year.

The bottom line is this: In the short space of a year, the Amiga has confounded and (in some cases) outlasted its critics and has proven itself to be one hell of a computer.

Redefined constantly during it's first year and continuing to be redefined with each new application, it is now also defining new applications that will broaden the base of reasons for using a computer. In completing one cycle, a new cycle has begun.

From being an Anything Box, it is now well on it's way to becoming an Everything Box—and isn't that what you always thought a computer should be? ●

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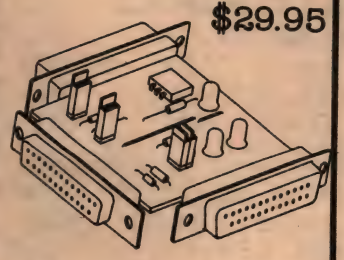

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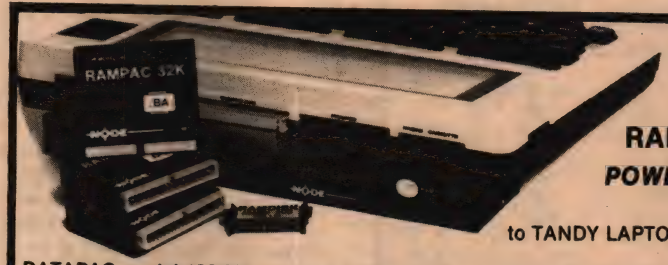

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not necessary in deep space; that these are the products of an alien culture; and that you are not so pretty yourself, having the head of an owl and the body of a man.

If you're lucky enough to blow up an enemy ship, you may see a somewhat reptilian alien floating in space with the debris. Now is the time to activate your scoops and try to bring him on board, for extra bounties are paid for captured aliens.

A further problem is your supply of fuel and weapons. With the bounties you've collected, you may buy more but you must take delivery by making a rendezvous with a supply drone and then using your scoops to get the cargo or fuel aboard your own vessel. Not easy.

Finish a mission and try to find a Stargate by which you can warp back to your home planet. Your reward in credits is shown and you're allowed to fly another mission. Fail and you're treated to a screen showing your own debris floating in space, along with a message of the credits you would have had you survived.

Documentation is both excellent and sparse. Moreover it is entertaining reading, as exemplified by an opening paragraph describing the automatic bounty allocator on your ship and the consequences of trying to obtain more bounty than you have earned: "Anti personnel devices have been fitted to them so tampering must be a deep philosophical decision for anyone contemplating interference."

Fully as complex as Star-Fleet, Deep Space succeeds because it is entertaining, because the action is immediate and "on stage" and because excellent use is made of the Amiga's graphics and sound. In the end, we would expect nothing less from the company that gave us Brattacas during the dark early days of Amiga gaming.

Deep Space is a product of Psygnosis, LTD in Liverpool, England. Though I don't know the name of the distributor, it is widely available and has a suggested retail price of $44.95. 512K is required.

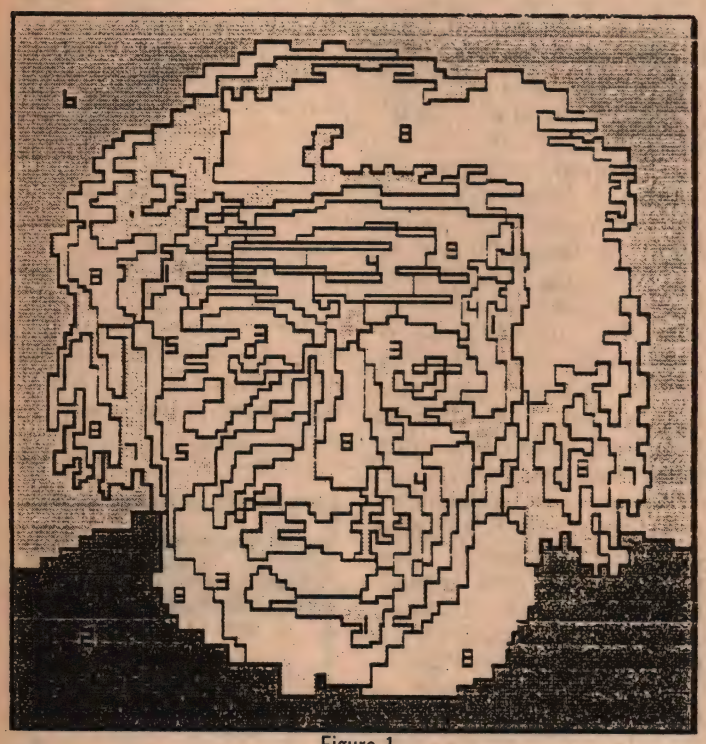

Figure 1

Ogre

Ogre is a computer translation of a board game that, I'm told, has been very successful among those who like battlefield simulations. This is a bit different in that it does not purport to simulate a battle of the past but one of the possible future.

The Ogre is a supertank with immense firepower and a super targeting system. Arrayed against it, you have what seems to be conventional tanks, missile launchers and infantry. In play, you may have the computer controlling the Ogre or you can have one of your friends take the part of the enemy.

Other than the fact that it uses a pull-down menu for storing, loading and starting games; and pop-up windows to advise you when you've not made a move, the play is pretty much as it would be on a real board—the board here being large enough that some screen scrolling is necessary to see all of it.

You select icons to represent your forces and place them in the board's hex squares by dragging with the mouse. Play is by taking turns and at your turn you may move your forces or, if within range, fire at Ogre. Ogre, of course, will do the same when it is his turn.

Rather than seeing a destroyed piece simply removed from the board, some graphics animation is involved in letting you know it has been hit or destroyed and if your command post is destroyed the game board is replaced by a full screen showing the CP in flames.

Documentation for Ogre is rather extensive and there is a separate book on strategy and hints as well as a quick-reference card for the Amiga. In addition, you're provided with an ID tag to be worn while playing the game.

Ogre is a production of Origin Systems and is being distributed by Electronic Arts at 1820 Gateway Drive in San Mateo, CA 94404. The Amiga version requires 256K and carries a suggested list price of $39.95.

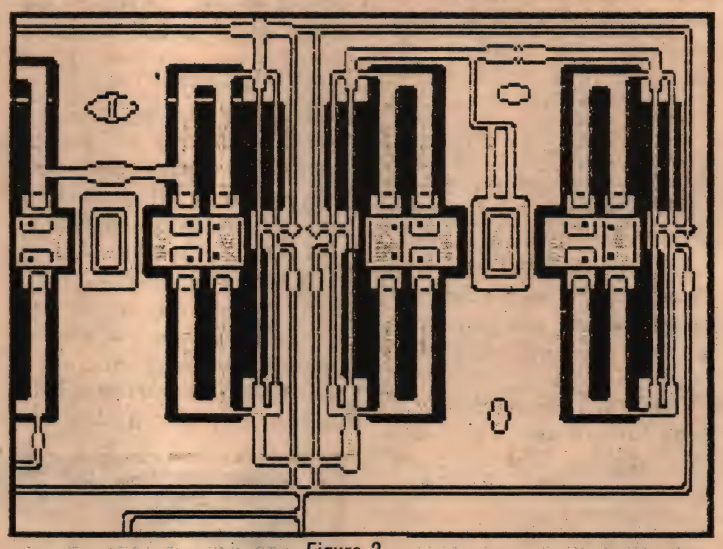

Figure 2

The computer circuit in this image is called a Josephson junction device. These junctions, which act as extrememly fast switches, are located in the regions you will color orange. The narrowest channels, which are colored yellow, are actually about 2.5 micrometers wide (considerably narrower than the edge of a sheet of paper). When this green, yellow, purple, and orange pattern is completely colored, it will not look much different from the actual colors of the microphotographed chip.

New Technology Coloring Book

According to the packaging on this entry, the form used to present information is a key to understanding. If information is presented in both verbal and visual form—and especially if there is some use of the hands in drawing or coloring the images—information is more easily absorbed.

So it is that we have an Amiga coloring book that may give a somewhat reinforced understanding of complex subjects by allowing the user to interact with the images and to proceed at his own pace.

Documentation is sparse, and all the important parts are also contained on the disk. Briefly, there is a long menu of topics and you select the one of your interest with a mouse-click. After a short search through a database, you're presented with a black-and-white rendering of the subject that intentionally resembles a paint-by-number board.

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Amiga vs Atari
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more time to do the calculations in the first place!

Mr. Scott insinuates the Amiga is somehow inferior because it can be connected to almost any monitor available and that the ST, limited to two monitors, is superior. Sure, the color saturation of the ST color monitor is good, and the monochrome monitor has a rock-steady display. But I find both are completely inadequate in most professional environments because the screen displays are too small to be read from any appreciable distance. This is especially true of the monochrome display, which is only slightly larger than that of the Apple Macintosh. The Amiga display is much larger than the ST, and so is easier to see at a distance, and it can display the same resolutions that the ST monitor can. The major reason one would have for getting a monitor other than the Amiga 1080 color monitor is the same reason one would have for getting a different monitor for an ST—the ability to display 640 x 400 graphics clearly. The Amiga 1080 monitor is adequate for 640 x 400 color graphics in some circumstances. The ST can't display that resolution in any situation without the hi-res monitor. And while the Amiga is capable of 16-color 640x400 graphics, the ST is limited to monochrome only.

I'd like to know more about "the notorious bugs" Mr. Scott has found with the Amiga. As a programmer, I find the Amiga a joy to work with. The library functions are straightforward, and the reams of documentation are excellent. Since the Amiga's introduction, there have been only two revisions of the OS and Commodore-Amiga has worked hard to ensure compatibility with future hardware. The ST is difficult to program, doesn't even contain a complete version of GEM, and what documentation is available is so poor that individual manuals actually contradict each other. I've listened to the non-stop complaints from professional programmers about how difficult it is to do anything on the ST. This is the reason why most programs ignore GEM and the ST operating system entirely. There have already been eight different OS ROMs for the ST and many programs won't run under several of these versions. Atari has hinted at a multitasking OS for the ST in the future, however, you must bear in mind that it won't be compatible with the current version of TOS.

The vast majority of the system crashes on the Amiga are experienced when the user starts an application that requires more RAM than is available. I've had a 2.5 meg Amiga for two months and I've yet to experience a crash. In any case, I would much rather have a computer that experiences occasional software failures than a computer with hardware problems. A very large local electronics dealer recently dropped the ST entirely after receiving a shipment that was 100 percent dead on arrival. Many ST owners have experienced problems with the ST, and have waited to get them serviced, and waited, and waited...

Sounds eerily reminiscent of the problems surrounding a machine once called the Commodore 64, doesn't it?

Concerning multitasking: The only programmers I know who laugh at multitasking are currently unemployed. ST owners like to start up two dozen dotty windows and then point out how slow the Amiga runs, using this bizarre form of logic to imply that the Amiga will be just as slow running two or three programs. The utility of multitasking on the Amiga is not to have one person run a dozen applications simultaneously, but to have many programs resident in memory at once. IBM programmers have gone to great lengths to create programs that can be resident in memory with other programs; in the future it will be an absolute essential, especially with business applications. I can edit a program on the Amiga, save it to a RAMdisk, start up a terminal program, press a key to automatically dial my office, log-on to my office computer, upload the source code from the RAMdisk at 2400 bps, instruct the office computer to compile the program while saving any errors in the capture buffer, and then log off. Big deal, right? Except that with the Amiga, I can return to the text editor while the entire procedure takes place. Neither application is slowed noticeably by the other. On another computer I would end up rebooting to switch between applications and the computer would be tied up in housekeeping for a half an hour in which I would have to find something else to do.

On the Amiga any application believes it has the computer completely to itself. There are not many programming considerations one must make to insure a program runs correctly on the Amiga. The ST can simulate multitasking using desktop accessories, but there are strict, tedious

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Amiga Workbench
continued from page 284

From a pull-down menu, you may select to add any one of the four available colors, thus building the picture a step at a time; or of filling in all colors at once. Once this is done, the program slows considerably as, in most cases, it fills the remainder of the screen with a shade of light grey that is not far removed from the default white. So far as the subject of inquiry is concerned, there seems to be no point to this routine for it does not in any way enhance the drawing. It may be, however, that this is a deliberate slowdown that has been built-in order to force a longer look.

Now, from another menu, you may select general information about the subject of the drawing. This is presented in text and may run to several pages. Another option is to select the Color Key, in which the subject is described more specifically as to its parts with the colors of those various parts being the key to understanding.

Coloring Book is not rigid in its format and the above steps may be taken in any order desired. It would be possible to call up the drawing, read the general overview, fill in one color and refer to the Color Key as each step was completed.

In its subject matter, Coloring Book covers a broad range of current science, ranging from the body at a molecular level to the Black Holes in space—with stops along the way for discussisons of lasers, computers, genetics, nuclear reactors, solar astronomy, acid rain and much more. (Figure 1 on page 284 illustrates an article on pixel imaging, Figure 2 is an article on Superconductive Microchips. Since some colors were changed to allow the best reproduction here, the purple areas described are actually white in our figure.)

It is too early to say how well I'll retain the information contained here and at best such a program can do no more than introduce a subject and outline current scientific thinking on that subject. Yet I've learned a few things I didn't know before and I've seen representations of things that cannot be seen with the naked eye. At a suggested list price of $19.95, the New Technology Coloring Book is well worth a look.

And for those who may desire a hard-copy. Coloring Book has its own Preferences menu, with support for all the usual printers so that—depending on what printer you have—they may be printed in either black-and-white or color. In addition, images may be loaded into Deluxe Print and either enhanced or made a part of another drawing.

New Technology Coloring Book is a product of The Software Toolworks—who are also responsible for Chessmaster 2000—and is distributed by Electronic Arts at 1820 Gateway Drive in San Mateo, CA 94404. 512K is required. ●

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Amiga vs Atari
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guidelines that must be followed to write a successful accessory. I can use any terminal program I like when multitasking on the Amiga. On the ST I'd have to use one that runs as an accessory, and try to find one that can upload even when its window is not active. Multitasking is the first step to a multiuser system and the Amiga is already a multiuser computer. If my friend wanted to use Aegis Images I could connect a serial terminal to the Amiga and do my word processing from there.

Since so many Atari zealots rant about how much more software the ST has than the Amiga, I made the rounds of several computer stores to see exactly how much ST software I could find. All the stores carried the same amount of software for both computers. When questioned, the proprietors of the stores agreed the ST has a shrinking lead of at best 15 percent. So the ST has a little more software. Atari users should know very well that quantity does not imply quality. Would they deny that the Atari 8-bit arena has a rather small software base, but that the average quality of the software is much higher than that of similar programs for the Commodore 64, which sports a much larger base? The same holds true for the ST and Amiga. I've seen Amiga public domain software that makes ST commerical software look sad by comparison.

Mr. Scott mentioned taking the covers off the machines to discover which was more advanced and to reveal their design philosophies. That is a good idea, if you are willing to remain objective. In taking off the cover of a 520 ST the first thing noticeable is the closed architecture—no 68000 bus or slots of any kind, and that a soldering gun is necessary just to get inside it. It is plainly evident the machine is not intended to be serviced, expanded, or upgraded. The machine can address a maximum of 4 megs of RAM, and the procedure for adding the extra memory requires significant electronics experience. A few electronics experts have only just managed to install a 68020 in an extensively modified ST. (True, the newly-announced Mega ST series will improve the situation substantially.)

Then we see four custom chips. Two, Glue and MMU, are merely optimized TTL circuits. They perform duties all computers must do to keep themselves running and all computers have comparable pieces of hardware. They were added to save cost and space—they add no functions, and so add no power to the machine. We see an entire custom chip devoted to disk DMA, and since disk DMA operations supercede the CPU, they steal cycles from the CPU, slowing it down during disk access. Then there is the SHIFTER chip, which provides 512 colors and an amazing three graphics modes. It is obvious that the first and foremost intent of the designers of the 520 ST was to make a cheap machine. In doing so they plainly meant to make a mass-marketable home computer—not a serious, powerful, or flexible machine—at least not the first time around.

The Amiga has three custom chips. The Amiga does disk DMA, but the DMA cycles are not stolen from CPU time the way they are on the ST. Also, the DMA functions do not occupy an entire chip, but are a subset of the sound chip, of which the major portion is occupied by four DA convertors. There is a graphics chip, which supplies 4096 colors, 22 graphics modes, dual playfields, fine-scrolling over a screen 1024 x 1024 pixels, and eight hardware sprites. The Amiga also comes with a sophisticated bit-mapped image manipulator much more flexible than the simple blitter which is optional on the ST. While the ST blitter occupies an entire chip, the Amiga bimmer is compressed to cover only a small part of a chip that also contains the 25 DMA channels and a pseudo-processor called the COPPER that handles a function similar to display-list interrupts on the 8-bit Ataris much faster than can ever be performed through software. Then there is the sound chip proper, which provides four-voice sound, custom waveforms, stereo output, and the ability to play back digitally sampled sounds. It is obvious to anyone with an objective standpoint that the Amiga hardware performs more functions more powerfully than does the Atari ST. The Amiga hardware requires a higher level of integration for manufacture, and thusly represents a more advanced technology.

The Amiga has a processor bus and its designers have worked hard to see that expansion devices conform to a standard called Zorro. Currently the Amiga can be expanded to 8.5 meg and doing so only requires the user to snap a board into the computer. Also, a new Amiga computer fully compatible with the present version will be expandable to 10 meg. The software itself is written to insure compatibility with future 68020-based Amigas and adding a 14 MHz 68020 to the Amiga 1000 is simple. The designers of the Amiga meant it to be a serious, powerful machine with expansion potential to keep it viable for years to come.

The "which is better" argument has gone on for some time now, in the pages of *Computer Shopper* and elsewhere, and I know it's not about to end with my comments. But more than anything else I am struck by a supreme irony in the entire situation—one that cannot help but make me laugh.

The most loyal of the Atari loyalists—not the pretenders, but the genuine item—the ones that have backed Atari since long before it belonged to the Tramiels—can they believe that loyalty to Atari means backing the ST, when nothing could be further from the truth? When the company changed hands, the purge was unbelievable—out the door went many competent technicians, programmers, and engineers. With the exception of a single person, those people were replaced by people who accompanied the Tramiels in their mutiny aboard the S.S. Commodore. The ST is designed, created, manufactured, and marketed by the same people responsible for the Commodore 64, the machine which served to severely darken the future of the far-superior Atari 8-bit series. The Amiga is, on the other hand, a creation from the very same brilliant minds that brought us the Atari 400 and 800 series—machines that the most decorated, qualified Atari veterans will quickly tell you were years and years ahead of their time. Commodore had nothing to do beyond acquiring the rights to it. The Amiga is in point of indisputable fact the next-generation Atari that we 800 owners waited so long and so hard to see. The Amiga is in point of fact the machine in which the original Atari spirit, which we might label "Power Before Profits," now lives on. ●

Pagesetter
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the box out to the size and shape you want. At this particular point, you don't have to worry about what you'll eventually put into the box, but it would be nice to have some idea: if you're going to do a headline, a short and wide box at the top of the page will do nicely. But if you later decided you want a vertical picture in that box, you're going to have to redo something. One of the nice things about Pagesetter is that you can redo it, again and again, by moving boxes all over the page until you have things exactly right.

Okay, it's a headline and there are two ways to handle this: First and easiest is to click on the QuickText tool. A requester appears, similar to the one you get from Workbench when you rename a disk, and into it you may type up to 100 characters. The other way is to use the full editor, but we'll look at that later. Type in your headline, click on OK and the requester disappears while your headline appears in the box.

It will be small because your page is small, but there are two degrees of magnification that may be invoked by clicking on the magnifying glass tool. At it's largest, you'll see only a small portion of your page, but fortunately there is a gadget that allows you to slide the screen over the page and view any portion of it you wish—at any time.

(Before describing other actions that may be taken, we need to make one thing clear: actions will take effect in the currently selected box—which is marked by a heavy brown outline. Inactive boxes are shown by dotted lines. It is a good thing to remember when you have several boxes on the screen.)

Now, if you wish to dress up that headline, you go to the pulldown menus and select Current Box. A large requester window opens and you can manipulate your text just about any way you like: justify to left, right, or both—or center your text; select a font and a size from the standard Notepad font library; set top and left margins; select any of about twenty textures; select one of half-a-dozen outlines; select leading between lines; and set letter separation for micro-justification. Again, remember that these operations affect only the currently active box, so you can do things entirely differently with the next box.

Drawing a vertical box will give you a column and the ruled markings at the top of the page will guide you in getting

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all columns the same size—if that's what you want to do. For clarity and readability, I'd suggest no more than three columns to a page.

And once you've drawn a column, you have to put something in it. Go to the pulldown menus and select Edit. The screen now changes, flipping you to a white-on-black screen that is your full text editor. Thankfully, all you have to do is to start typing and use the standard Amiga editing keys to insert or delete as necessary. You'll probably appreciate the fact that you don't have to learn a new word processor in order to use Pagesetter.

From another pulldown menu, select Exit and you'll find yourself back at your page with no text in your column. The text has gone to a buffer and to add it to your sheet you must select the pencil tool, drag it to the column and click your mouse. Suddenly, there it is, all in a nice, neat column that you'd always thought beyond your capabilities. (Well, mine anyway.)

Should your prose run longer than a single column can hold, you'll receive a message telling you so and it is now that you use the Link tool to link one or more columns together so that your text flows from one to the other.

And at this point you can return to the Current menu and perform the same justifications and embellishments that you did with your headline. Or different ones. For myself, I prefer the nine-point type for text; six-point prints out just a bit too small.

(Incidentally, this is probably the place to state my one quibble with Pagesetter. Since it uses the Notepad fonts and sizes, the largest type available is only twenty points—as used in the headline in my illustration. For those of us who were influenced to journalism by watching movies like *Come Fill The Cup* and *Deadline U.S.A.*, it is rather frustrating that Pagesetter does not give us the ability to create a bannerline that fairly screams it's message.

(If your headline is MAYOR STEALS CITY HALL and it's only in twenty-point type, who cares? Myopic people won't buy your paper—and probably won't notice the vacant spot in the town square.)

While you were pulling down the menu that said Text Editor, you noticed a selection labeled Graphic Editor. Click this on and the screen changes again. Now it is a beige blank and down in the lower left corner is a selection of drawing tools with which you may create your own graphics. Left alone for a sufficient period of time, I might create something, but instead I went to the menu and loaded the graphics requester.

This popup box makes it easy to select the paths and directories for disk access, either to reach the clip art contained on the Pagesetter disk or to reach any other disk with graphics stored in the IFF format—such as pictures created with Deluxe Paint, Images or Draw.

If you opt for this easy way, use the Frame tool to outline the picture or the portion of the picture you wish to include, then exit back to your page. The picture is in the buffer and you must now select the paint brush, drag it to the proper box and click your mouse.

(Should you wish your illustration to appear in a column in the midst of text, it is an easy thing to do. Simply make your column of three separate boxes, stacked one on top of the other. Use the Link tool to combine the top and bottom boxes for text, leaving the middle box free for your graphic. Within that graphic box, you may also create a smaller box to be used for a caption.)

Although the Current box will work on graphics for such

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DOS-2-DOS Easy File Transfer: MSDOS To AmigaDOS

by Ronald Bobo

I waited eagerly last year for the Amiga Transformer to appear in the local stores. There were a number of programs written in BASIC for other computers that I wanted to convert to AmigaBASIC.

My system for transferring files at that time was as follows:

In order to reach from a Compaq to the Amiga, a total of three RS-232 cables were strung together along with sufficient adapters to mate all the cable ends together, and a null modem adapter for reversing the transmit and receive lines.

Since the two computers were on opposite sides of the room, it was not possible to leave the cables in place—each transfer session necessitated stringing the cables anew.

With Crosstalk XVI running on the Compaq, both computers could be controlled from the terminal program on the Amiga. Transfers took place at 9,600 baud, and this system worked reasonably well so long as no one wandered through the room and stumbled over the cable, thus effecting a disconnect in the middle of a file transfer. It was much slower, though, than copying from disk to disk or disk to memory. The Transformer, I thought, would solve my problems and make everything much easier.

I was disappointed. The Transformer provided NO means for copying from MSDOS to AmigaDOS disks or vice versa. For all intents and purposes, the Amiga became an MSDOS machine, with no access whatsoever to AmigaDOS formatted disks.

Sigh. Back to the strung-together cables.

Then ads started to appear in some of the Amiga publications for a product called DOS-2-DOS which claimed to transfer files between AmigaDOS and MSDOS disks. At first, I ignored the ads. After all, a Transformer-like program had also been advertised in 1986 and, so far as I know, it's still vaporware. The ads for DOS-2-DOS, though, kept appearing.

As it happened, AmigaDOS Version 1.2 appeared before I got my hands on a copy of DOS-2-DOS for review and it had, tucked away on the Extras disk, a utility for transferring files between AmigaDOS and MSDOS. Don't be fooled when you look at this disk. The icons give one the impression that two copy utilities are present. Both, however, bring up the same program with the only difference being some pre-set parameters.

The question will now surely arise, "If I get a free file transfer utility with AmigaDOS 1.2, why should I lay out money for another utility to do the same thing?"

Well, there are several possible reasons, which we will discuss, then you can be your own judge.

First of all, the Format utility included on the Extras disk does not support the new MSDOS 3.5 inch disk format, whereas DOS-2-DOS does. If you are using a 3.5 inch drive

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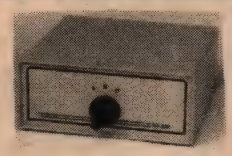

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Pagesetter continued from page 287

things as texture and outline, justification is controlled from a tool on the main screen. Looking rather like a set of compass points, it works by moving your picture as you click on one of the points, allowing you to center it within the box as you wish.

And that is just about all there is to desktop publishing on the Amiga. If you get very deep into it, you'll want to investigate micro-justification a bit more closely. This is similar to the "kerning" you've heard about in such programs, where the spacing between letters is very closely controlled to make your page look as though it has been typeset.

If you're determined to publish a book or a pamphlet, you'll enjoy knowing the Pagesetter allows you to have up to 99 pages defined (though not all of them can exist in memory simultaneously, more on that later) and to print them all in one print run.

This will be slow, since Pagesetter must treat pages as graphics and use the slower graphics speeds on your printer. Additionally, graphics use only the first 512K of memory in your Amiga. Even if you have a memory expander that gives you megabytes, little or none of that memory will be used. Thankfully, there are warning signs to let you know when you're too close to the edge and these will usually occur while you still have enough free memory to save your work.

In saving, the page is saved as a complete entity, not as a bunch of separate boxes: when you call it back, it is all there before you, ready to be edited or revised as needed.

We found the documentation of Pagesetter to be very good and think the average person should be able to turn out a newsletter with only one or two evening's work. In fact, the documentation comprises only half the book: the second half is a short and good course in the dynamics of advertising and page layout. Then there is a very good glossary of terms and several pages that show you the clip art included on the disk.

I'm rather happy that the first Desktop Publishing program for the Amiga turned out to be both easy and good, and for several reasons. It is another push of the Amiga into the mainstream of computing; it has shown me I don't have to think publishing is beyond my ken; and best of all, I don't need a laser printer to do it.

Pagesetter is available from Gold Disk, Inc. at P.O. Box 789, in Streetsville, Ontario, Canada L5M 2C2 and at a suggested list price of $149.95. 512K is required. ●

Xerox Desktop Publishing Has Seven Systems Offerings

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The Xerox personal computer products available for use in XDPS include the Xerox 6065 PC equipped with a 20 megabyte rigid-disk drive and 640 kilobytes of random access memory; PC or word processing keyboards; an optical mouse; full-page, partial page or color monitors; MSDOS operating software, Xerox Writer III word processing software and Xerox Ventura Publisher. XDPS printers include the Xerox 4020 color ink-jet printer and recently introduced 4045 Model 50 laser printer/copier configured with 1.5 megabytes of memory. By choosing one of the seven Xerox configurations, customers can establish a desktop publishing system that suits their individual needs.

Xerox Desktop Publishing Systems are treated by Xerox as complete products from order-entry to delivery to service, providing ease of selection, efficiency in servicing and simplicity in billing. Users are relieved of the burden of carrying individual service contracts on different types of equipment and can rely on a single vendor for support. For partial systems, a variety of Xerox service arrangements are available that can cover both Xerox and non-Xerox products.

The seven systems include:

Model 601: Includes Xerox 6068 PC-based word processor with 20 megabyte rigid-disk drive and 640 kilobytes of internal memory; full-page display; word processing keyboard with optical mouse; Xerox 4045 Model 50 laser printer/copier with 1.5 megabytes of memory; operating system software; Xerox Writer III word processing software; and Xerox Ventura Publisher. The system is priced at $9,995. (Priced separately, system components cost $12,420.)

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DOS-2-DOS continued from page 287

as the MSDOS drive, DOS-2-DOS will always format it to 720K. It can, however, read and write to the 3.5 inch 360K format. If you want to use 3.5 inch disks with the 360K format, it must be done under the Transformer. (Incidentally, Format is a separate program on the AmigaDOS Extras disk—DOS-2-DOS does everything with one program.)

DOS-2-DOS is a reasonably small file (25K or so, about half the size of the Commodore utility) and can only be invoked from the CLI. Although my Workbench disk was almost full, I deleted EDIT (which I never use) from the c/ directory and copied DOS-2-DOS over in its place. Now it's available whenever I need it, without hunting up a special disk.

When DOS-2-DOS is invoked, it remains in memory until your file transfer session is finished. This is especially convenient if you have only one 3.5 inch drive, since the disk containing DOS-2-DOS need not remain in the drive.

Like the Commodore utility, DOS-2-DOS accepts directory paths for both AmigaDOS and MSDOS. Unlike the other program, however, DOS-2-DOS allows use of wild card characters (AmigaDOS version for Amiga files, MSDOS version for files in that format). One could, for instance, copy all files with the extension ".doc" from MSDOS to AmigaDOS in one operation with the following command:

```
COPY DF2:*.DOC -A -R
```

The -A and -R are command line options. The -A tells DOS-2-DOS to perform line-end conversion on the ASCII file as it copies. This is necessary because MSDOS uses carriage-return and linefeed characters at the end of each line, while AmigaDOS text files have only a linefeed.

DOS-2-DOS also strips the high bit from all ASCII characters, thus converting Wordstar type files to a format compatible with Amiga word processors.

The other command line option, -R, directs DOS-2-DOS to automatically replace a file with the same name if it already exists on the destination disk. If this option is omitted, DOS-2-DOS will pause and ask if you wish to replace the file. A good safety feature.

As stated earlier, DOS-2-DOS is invoked from the CLI (Command Line Interface). While this may upset some mouse and Workbench purists, I can think of at least two good reasons for this approach. First, not having to include code for screens and windows, along with all the extra code necessary for communication in the Workbench environment, reduces the size of the program considerably. Although this may not be the only reason for the difference in program size, contrast DOS-2-DOS with the PC Utility included with AmigaDOS 1.2 which is roughly twice the size of DOS-2-DOS—and a second program is needed to format MSDOS disks when using the Commodore utilities.

Secondly, the program was written for people who are already familiar with MSDOS, thus the MSDOS-like commands used within the program.

To quote George Chamberlain of Central Coast Software, "DOS-2-DOS was written for the person who, for example, might bring a Lotus spreadsheet home to do further work on it using VIP Professional. Afterwards, he would transfer

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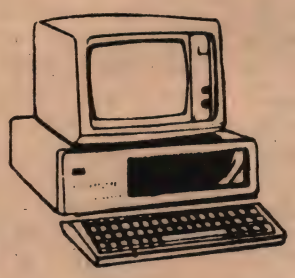

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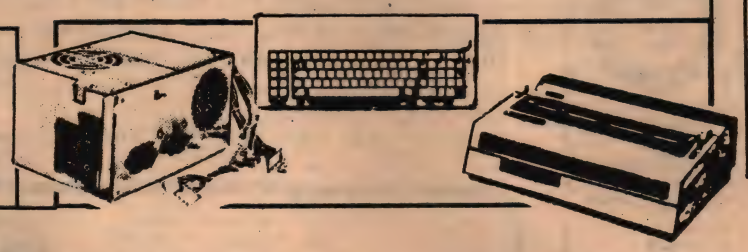

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DOS-2-DOS
continued from page 288

it back to an MSDOS disk and take it back to work the next morning."

"This person is already familiar with MSDOS and will have no problem using the DOS-2-DOS commands. In fact, if a person is not familiar with MSDOS, he would probably have no use for the program anyway."

Once installed on your work disk, DOS-2-DOS is invoked from the CLI by typing "d2d". The program loads and asks which drive will be used for MSDOS. Type in the AmigaDOS designation for the drive, e.g. "df2", which must be an external drive. Do not use the customary trailing colon, ":", after the drive designation—for some reason this will cause everything to freeze up, necessitating a reboot of the Amiga. Once the drive designation has been entered and RETURN pressed the DOS-2-DOS prompt, "D2D>", appears and the program is now ready to accept commands.

DIR or DIR followed by a path name displays a disk directory (or sub-directory). Path names for AmigaDOS disks follow the Amiga convention of using slashes as separators, e.g., drive: path/-file. Pathnames for MSDOS disks, on the other hand, use the MSDOS conventional backslash as: drive:path\file.

CHDIR followed by a drive and/or path name logs one into a different directory.

ASCII files may be viewed on either AmigaDOS or MSDOS disks using the Type command. This feature is not available in the Commodore program.

The Copy command has already been discussed briefly. Path names can be used for both the source and destination disks and, as previously mentioned, wild cards may be used for the source disk only. For Amiga disks, the AmigaDOS wild card characters ("#" and "?") are used, while the "?" and "*" are used for MSDOS disks.

Delete will erase a single file from either an AmigaDOS or MSDOS disk. Wild cards are not accepted; deletions must be done one at a time. Drive and path names are optional for AmigaDOS files, but the drive must be specified for MSDOS files. If no path is specified, the current MSDOS directory is assumed.

Format will format either a 5.25 inch or, as discussed previously, a 3.5 inch disk for MSDOS. MSDOS disks formatted by DOS-2-DOS contain no boot record, so cannot be used to start up a MSDOS machine; they can, of course, be used to transfer files to or from MSDOS machines.

In addition, several different types of formats can be done with DOS-2-DOS. For example, "FORMAT /1" will format a single-sided disk; "FORMAT /8" formats a disk with only eight sectors per track. It is not necessary to specify the drive when issuing the Format command—whichever drive was designated for MSDOS upon program initiation will be chosen automatically.

DOS-2-DOS does not format AmigaDOS disks; such disks must be pre-formatted using either Format from the CLI or the Initialize routine from Workbench before your copy session starts.

Typing "HELP" or "?" displays a summary of DOS-2-DOS commands. "EXIT" or just plain "X" gets you back into AmigaDOS.

DOS-2-DOS takes control of the Amiga disk controller hardware in order to access the MSDOS drive. Since this could cause interference with programs running in multitasking mode, one should never run other programs while using DOS-2-DOS.

One section in the DOS-2-DOS manual warns that, if the Workbench disk is removed after loading DOS-2-DOS, it will be necessary to use the disk volume name rather than the drive designator; otherwise AmigaDOS will put up a requester asking that the Workbench disk be loaded.

I found this not to be the case; the only time the requester appeared was when I replaced the Workbench disk with another volume and then tried to do a DIR without giving any drive designator. So long as I used "df0:" with the DIR or Copy commands, no requesters appeared.

After using the external 3.5 inch drive as a MSDOS drive, the Amiga must be rebooted following the copy session in order to regain control of that drive. Although the wording in the documentation might lead one to think that rebooting was necessary after every session with DOS-2-DOS, such was not the case when using a 5.25 inch drive for MSDOS.

The manual is only sixteen pages long, but is very complete and easy to comprehend. It is attractively packaged in a hard vinyl cover, with a pocket inside for the disk. There is also a "readme" file on the disk containing supplementary information. Two files in fact, for Central Coast thoughtfully provides two copies of both the DOS-2-DOS program and the text file on the same disk.

The price of DOS-2-DOS is $55.00 plus $3.00 shipping and handling if ordering by mail.

The DOS-2-DOS manual contains the usual disclaimers—that is, the company doesn't guarantee that the program will do anything—but at least they don't attempt to make you buy a copy for each Amiga you may own. The user is permitted to use the program on multiple machines, so long as it is only used on one machine at a time.

On the other hand, the program did perform as claimed and it is not copy-protected, making it easy to install on your Workbench disk—which should count for something, in these days a paranoia among software publishers.

All-in-all, I'm glad I now have DOS-2-DOS. I believe it to be a more powerful and feature-laden program than the alternative, while taking up much less space on a disk.

For further information, contact: Central Coast Software, 268 Bowie Drive, Los Osos, CA 93402, 805-528-4906 or your local Amiga software dealer. ●

Three From Maxisoft For The Amiga

Reviewed by Cheryl Peterson

Maxisoft's three programs for the Amiga add desktop utilities, telecommunications and spreadsheet capabilities to the Amiga. Overall they aren't a bad lot, but none of them stands out as being an exceptional buy.

Maxicomm Retail Price: $150

Maxicomm is a very simple terminal package that supports X-on/X-off, XMODEM and extended XMODEM protocols. With the extended XMODEM protocol the last block is truncated to the proper length. This is an important consideration, since files with pads at the end will not run. It drives the serial port at 300, 1200, 2400, 4800, or 9600 baud and supports 7 or 8 bit words. It can be set for even, odd or no parity with one or two stop bits.

If using capable modem, Maxicomm will auto-dial and auto-answer. Auto-redial can be set to dial a specific number of times or until interrupted. An auto-logon feature uses scripts to send user ids and passwords. Function keys can be set for special commands.

I found Maxicomm works quite well. After a few hours of use it would lock up on me. I expect this is a memory-limitation problem. The transfer protocols worked fine. Everything seemed to come through well.

I had problems when accessing the menus while communicating. Garbage was generated onscreen and occasionally I would find things locked up when I went back to the telecomm screen.

The manual is very plain. The sample is a session on MaxiCorp's public BBS. The phone number and logon procedure are on the disk.

For $50, it's not a bad terminal program. I've seen public domain programs that are its equal though.

MaxiDesk Retail Price: $70

MaxiDesk contains six applications to simplify desk chores; a calculator, a note pad, an appointment calendar, an alarm clock, a phone books, and what Maxisoft calls a "keyboard helper" that looks an awful lot like an ASCII-hexidecimal-decimal lookup table. These are not memory resident utilities, but a group of programs on disk that are loaded under Intuition. In its original incarnation with copy protection in force, the disk had been seated in one of the drives whenever you accessed one of Maxidesk's applications, making it a major hassle to use. With two disk swaps necessary to load the note pad, use it and

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Three From Maxisoft
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go back to whatever project was in progress, it hardly seemed worth the effort.

Now that the company is offering the program on an unprotected disk, it should be possible to put Maxidesk on other disks for convenient access. If I were planning to buy the package though, I'd try it out first to be sure it was unprotected and that it could be copied to my work disks. In my explorations of the programs abilities, I managed to destroy two copy protected versions in very short order. Not before I had at least tried all the features, luckily.

The data entry in all the modules is pretty standard, so it isn't confusing to use any one of them. These conform well to the standard user interface of Intuition and require little additional instruction. The program creates backup files whenever a save is done, making it less accident prone. I found myself using the accesories without having to refer to the manual at all.

However, there was one thing that I would have liked to see in the manual that wasn't there. A way to use the program from the CLI (Command Line Interface).

I actually enjoyed the program's modules. I found the phone book especially nice. The name is misleading since it is actually an address book that can dial phone numbers through an auto-dial modem. In addition, it can log all the calls you place; start time and duration. This log and the numbers in the phone book can be printed for later reference. You can also print mailing labels using the addresses in your phone book. Multiple phone books and logs are possible. Since each phone book is limited to 300 entries, more than one may be necessary. By categorizing these books, searches take less time and allow easier access to numbers and addresses.

The appointment calendar appears small on the screen, but dates can be opened to hold your appointment lists. It can store up to 50 appointments per day. If you wish to use it to monitor tasks performed, you can mark finished items with an asterisk. Unmarked items can be carried over to the next day simply. A week at a glance feature shows the days of the week with the first four unmarked items in each day. This information can be printed out as needed. I found this module to be quite satisfactory.

The clock and alarm are nice touches. The alarm will flash the screen at you and in the latest version deliver a verbal message at the same time. There's a built-in "snooze feature" that can be used to acknowledge receipt of the alarm and reset it to go off in another five minutes. Each click on the delay switch adds another five minutes, so it's really a variable "snooze reset." The clock includes day of the week, date and time. Time is presented in 24 hour format in the original, but can be set to 12 hour AM/PM in the latest version.

The note pad supports messages 45 columns by 50 lines long. A menu of ten topics appears when you access the note pad. You may have as many note pads as will fit on the disk. Clicking on one makes it active. The help files are contained in a note pad already on the disk.

The calculator handles both decimal and hexidecimal numbers. It doesn't have any fancy scientific functions, only add, subtract, divide and multiply. It does have four memory storage areas and calculations can be performed on or with numbers stored in the memory areas.

I think the unprotected version of this program would be a nice addition for anyone concerned with getting better use from their time. I do think the package is slightly overpriced, $50 seems a much more reasonable price tag.

MaxiPlan is a spreadsheet program with database and graphing capabilities built-in. It also offers a utility that converts Lotus 1,2,3 files into MaxiPlan files. A MaxiMerge utility simplifies transporting data from MaxiPlan to other applications. It has most of the features commonly available in spreadsheet programs and uses the mouse and menus for information input.

If you wish, MaxiPlan will verbally repeat entries or infor-

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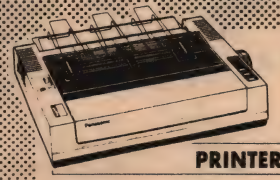

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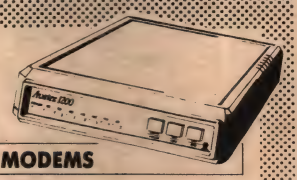

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Compaq Computer Corporation Introduces Portable Computer

Compaq Computer Corporation has introduced the Compaq Portable III, a high-performance portable personal computer that provides business users the ultimate in full-function portability.

By incorporating a 12 MHz 80286 microprocessor, the Compaq Portable III provides the power and functionality of a high-performance desktop computer in a small but rugged, self-contained unit that is easy to carry from office to office, office to home, or while traveling.

The Compaq Portable III starts at 18 pounds and includes a 2 MHz 80286 microprocessor, up to 6.6 Megabytes of random access memory (RAM), up to 40 Megabytes of shock-mounted high performance fixed disk storage, and an industry-standard 5¼-inch diskette drive. It also features an easy to read dual-mode plasma display, full size detachable keyboard and an optional Expansion Unit that accommodates two full-size, industry standard expansion slots.

The Compaq Portable III runs the most popular business and professional software up to 50 percent faster than 8 MHz 80286-based products. The Portable III Model 1, Model 20 and Model 40 have suggested resale prices of $3,999, $4,999 and $5,799, respectively.

"Unlike many other portable personal computers, the Compaq Portable III was designed with a true understanding of how business people and professionals use personal computers. It accommodates their need for full functionality and portability without compromise," said Rod Canion, President and Chief Executive Officer, Compaq Computer Corporation. "It far exceeds the performance of 'laptop' computers, which sacrifice many functions and features for reduced size and weight."

Speaking at a New York City press conference to introduce the product, Canion said, "Compaq was able to achieve this level of full-function portability through our portable engineering and design experience and the practical application of surface mount and ASIC (Application Specific Integrated Circuits) technologies. These two technologies not only help reduce the size and weight of the Compaq Portable III, they also contribute to reducing production time and costs.

Small Size, Full Power

Measuring 9.8 inches high by 16 inches wide by 7.8 inches deep, the Compaq Portable III is dramatically smaller than high-performance desktop personal computers and occupies the same amount of desk space as many laptop computers. When used with its tilt and swivel desktop pedestal, it provides the convenience and functionality of a desktop computer and yet delivers more features and performance.

- Memory—In its standard configuration, the Portable III includes 640 Kilobytes of RAM expandable to 6.6 Megabytes on the main system board. RAM is expanded by adding a Portable III Memory Expansion Board and installing either 512-Kilobyte Memory Modules or 2 Megabyte Memory Modules.
- Data Storage—The Compaq Portable III features a choice of 20 Megabyte or 40 Megabyte high performance fixed disk drives. Both have access times of under 30 milliseconds and are shock-mounted for ruggedness and reliability. The Portable III also includes an industry-standard 5¼-inch, 1.2 Megabyte diskette drive, with a 360 Kilobyte diskette drive optional, making it fully compatible with the installed base of industry-standard application software.
- Display—The Compaq Portable III features a dual-mode plasma display that is fully readable in any light and adjustable for maximum viewing comfort. The plasma display features an automatic cut-off and provides text and graphics on the same screen. Graphics is supported for a 640x400 pixel mode as well as for the industry-standard CGA resolution of 640x200 and 320x200.

In addition, the Compaq dual-mode text and graphics display capability has been enhanced to include accurate on-screen shading and highlighting of text. It is the first time such features have been available with a plasma display.

- Expandability—Many Portable III features such as memory and communications have been internally incorporated, and further expandability is provided by the optional Expansion Unit. By incorporating two full size, industry-standard expansion slots, the Portable III Expansion Unit can accommodate the most popular add-on boards for personal computers. It securely fastens to the computer with a single latch and assures alignment of the appropriate pin connectors. The Expansion Unit can be easily moved with the computer or detached using the same quick-release latch.
- Keyboard—A full-size, industry-standard 84-key detachable keyboard has a layout that is most familiar to personal computer users and includes a separate numeric keypad and cursor control keys.
- An automatic power line switching capability for international travelers automatically senses the difference in domestic and international current and switches from 110 volts to 220 volts.
- An optional internal 300/1200 baud Hayes-compatible modem is available for the Compaq Portable III, allowing for easy communications without external boxes.
- Standard on all models are parallel and asynchronous communications and RGBI interfaces.

Compaq also announced the introduction of MSDOS Version 3, Release 3.2 for use with its portable and desktop personal computers. In addition to full compatibility with previous releases of MSDOS, Release 3.2 contains several new commands, BASIC Version 3.2 and many enhanced commands and utilities designed to take advantage of special Compaq product features. Support provided for Compaq specific features includes high speed processing modes, high capacity fixed disk drives, fixed disk drive tape back-up, Compaq Dual Mode Monitor, Compaq Color Monitor and Compaq Portable III Gas Plasma Display. MSDOS Version 3, Release 3.2 is an option recommended for use on all Compaq personal computers. The suggested resale price is $95.

In conjunction with its introduction of the Compaq Portable III Personal Computer, Compaq announced that it will discontinue production of the Compaq Plus, Compaq Portable 286 and Compaq Portable II, Models 1 and 3.

The company also announced that it is reducing the suggested resale price of the Compaq Portable II, Model 2 from $3,599 to $2,999 and the Compaq Portable II, Model 4 from $4,999 to $4,499.

Compaq Portable III

The Compaq Portable III is available in three models:

- Compaq Portable III Model 1 includes: an 80286 microprocessor capable of running at either 12 MHz or 8 MHz; 640 Kilobytes of RAM; a 5¼-inch 1.2 Megabyte diskette drive; high resolution plasma display; full size 84-key detachable keyboard; 8 MHz 80287 coprocessor socket; parallel printer interface; asynchronous communications interface and RGBI interface for connection to a color monitor. U.S. suggested resale price: $3,999.
- Compaq Portable III Model 20 includes: an 80286 microprocessor capable of running at either 12 MHz or 8 MHz; 640 Kilobytes of RAM; a high performance, shock mounted 20 Megabyte fixed disk drive; a 5¼-inch 1.2 Megabyte diskette drive; high resolution plasma display; full size 84-key detachable keyboard; 8 MHz 80287 coprocessor socket; parallel printer interface; asynchronous communications interface and RGBI interface for connection to a color monitor. U.S. suggested resale price: $4,999.
- Compaq Portable III Model 40 includes: an 80286 microprocessor capable of running at either 12 MHz or 8 MHz; 640 Kilobytes of RAM; a high performance, shock mounted 40 Megabyte fixed disk drive; a 5¼-inch 1.2 Megabyte diskette drive; high resolution plasma display; full

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Books On Excel
continued from page 143

The authors start with a few assumptions about the reader's Excel and Macintosh literacy. This enables them to avoid lengthy instructions on how to set up the system, get into Excel and format disks.

When it comes to explaining planning and budgeting though, they do a thorough job. They take the time to explain why, as well as how, to go about analyzing profits, losses, cash flow and cash balance. They go into seasonal fluctuations, anticipating financial needs and preparing reports that show the business' current financial position.

The book includes a cash budget, pro forma income statement and pro forma balance sheet that can be adapted for use by most businesses. A chapter explains how to make the necessary adaptations for your business. Another shows how charting can bring the figures to life.

Though the three samples can be bought on disk, at $39.95 for three overlays I think they've got a lot of nerve. Half of that would be about right.

Computer, business and Excel tips separated from the rest of the text by boxes, help break up what could have been lengthy, dull instructions. Some good advice can be found in these.

Some of the attitudes expressed were a bit confused. While they take the tack that the principles in the book apply equally to small, medium and large companies, they slipped into the large corporation attitude of "find a good dealer and pay through the teeth if necessary to get a little computer support." Their recommendation to buy brand-name products with proven customer support makes sense. Expecting to get user support from the dealer is naive. For the most part though, their advice is well taken.

Planning and Budgeting With Excel offers instruction in the kind of business management principles that might be garnered from a college course and gears that knowledge toward a specific group of computer users. The authors have done much more than show how to use a spreadsheet program.

Advanced Excel
By David Bolocan
TAB Books Inc.
246 pages, $18.95 (softcover)

I think *Advanced Excel* is misnamed. Though it does deal with advanced features of Excel, the first ten of its 24 chapters are devoted to the basics of using both the Macintosh and Excel. This misnaming is a shame since many beginning Excel users may pass *Advanced Excel* over expecting it to be too complex for them. And those who are already familiar with Excel's basic features may find the early chapters tedious going.

Taking a tutorial approach, *Advanced Excel* includes sample applications that can be used by both home and business Mac owners. Projects outlined include a stock analysis spreadsheet, a simple invoicing and inventory module, a couple 1040 tax calculation forms, mailing list database and accounting system. It delves into linked sheets and data transfer between component modules in a spreadsheet grouping. It also covers the database and graphing capabilities of Excel. The more advanced topics like creating macros, tables and matrix calculations are all saved until the later chapters.

The book is well-illustrated with clearly labeled photos of hardware used. All the Macintosh system and the Applewriter printer components are defined to prevent confusing beginners. Screen printouts are used to show how each application should look as you are creating it. Again where necessary, labels are used to define objects on the screen.

I found *Advanced Excel* comparable to other books on the subject. Though the information was adequately presented, the writing style didn't make reading the book particularly enjoyable. Perhaps this is because of its textbook approach.

I must question the cover blurb "The only manual you'll ever need to become a grand

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Top Ten Books
continued from page 144

Que
$19.95
Copyright: 1987

Easy to understand instructions show you how to use programs that won't usually run on hard disks, activate "menu programs," back up data and store and retrieve libraries of information. A similar title is *Hard Disk Software Management* [$21.95] [Management Information Source].

Peter Norton's Assembly Language Book For The IBM PC

Peter Norton
Brady
$19.95
Copyright: 1987

Peter Norton makes complex technical material understandable to the lay person as he teaches the underlying principles of assembly language to beginning programmers. For BASIC programmers wanting to move on to assembly language, Peter Norton displays his flair for making complex technical material understandable.

Turbo Pascal Advanced Applications
Overbeek
Rockland Publishing
$16.95
Pages: 207
Copyright: 1986

An impressive anthology of articles, with contributing authors including such well known names as Dr. Richard Reese, Elliot Koffman, Dr. John Figueras et al. with 207 pages is jam packed with information title will appeal to academic as well as the advanced Turbo Pascal programmer. ●

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Next Greybox continued from page 151

Well, a few new H-89s are still being created all the time. Many HUGgies are still finding surplus replacement part CPU boards, and building them up. Every time a user tears out his H-89 CPU board and replaces it with a TMSI H-1000 or a DG Super-89, this frees up a used CPU board that can be stuffed into an H-19, creating a brand new H-89. Of course, this requires a power supply upgrade, maybe a new ROM, and some hardware tinkering, but it is well within the skills of most Heathkit builders. Used CPU cards used to go for about $200; I have recently seen them going for as little as $50 in *Computer Shopper* classified ads. Of course, even though there is an almost inexhaustable supply of H-19s out there that can be upgraded, a Heath CPU board will work with almost any other RS-232 serial terminal, too, so you don't have to have an H-19 or H-29, they're just convenient; I've also seen CPU boards built into Radio Shack DT-1s, Paradyne surplus terminals, and old outboard disk drive cases. What happens, though, when the supply of CPU boards runs out, as must eventually happen? What then?

Well, one possibility is the Ampro CP/M Little Board. It not only comes with a soft-sector controller on board that can format, read, and write to the Heath H-37 disk format, but the newer ones come with an SCSI Winchester port standard! Also, the Little Boards use less power and are physically smaller than the stock Heath CPU card. An Ampro Little Board stuffed into an H-19 should be indistinguisable from an H-89 running CP/M at 4 MHz, so far as the software running on it is concerned. (You would lose the H-17 hard sector and HDOS compatibility, though.)

Another possibility is only a little more far-fetched: As the newer 640K IBM PC XT and AT clones continue to proliferate, earlier model PC clone motherboards that can only support 256K RAM on board will become dirt cheap. There is room to stuff one of these clone boards in an H-19 cabinet if both the CPU and TLU boards are pulled out. By adding a V-20 or other Z80 CP/M emulator and an IBM-type disk controller with a program like Uniform, or Media Master, you could create a pseudo-H-89 that would be H-89 soft sector, CP/M software compatible, and also be as IBM compatible as the particular clone board used would allow. If older PC clone boards get really cheap, like under $50, this might become a popular option.

Doing it does require adapting the linear Heath power supply, plus the split-synch H-19 video display, and making physical room for the PC-style expansion slots, but it should be well within the skill level of more advanced Heathkit builders. One problem would be what to call the resulting hybird machine; perhaps a PC-89 Jr.? A couple of hobbyists have already actually done this, though so far as I know, they are just using the machines as cheap PC clones, and are not running CP/M emulators on them.

In any event, there are a number of encouraging signs for 8-bit fans on the Heath/Zenith scene:

In the area of hardware support, the big news is more competition and lower prices. Magnolia Microsystems, a longtime H-89 support company, has just knocked a hundred dollars off its XM-316 soft sector disk controller, probably to give stronger competition to CDR and TMSI. Like the CDR card, the XM-316 supports mixed 8" and 5-¼" drives on the same card, and now lists for $295. They've also announced price cuts on their SASI Winchester ports, the Winchester drives themselves, bank-switching RAM and CP/M+ upgrades, and outboard add-on floppy drive systems.

TMSI, for their part, has added a licensed copy of the Norcom, Inc. GT-PROM to their existing "Flicker Free" kit for the H-19, and are selling the combined package under the trade name, "Superset" at a slightly lower combined price. They claim this combination has most of the important features of the other replacement ROMs like the HUG-Watzman, Super-19, Ultra-ROM, etc. The advent of bigger, cheaper EPROMs has led to a bewildering assortment of enhancements from a number of manufacturers, most of which add extra character fonts and graphics to the stock H-19 set. TMSI will even burn a custom font for a user who needs an exotic foreign character set or something, if the user can provide it as a loadable hex file.

Besides the very large existing pool of CP/M and HDOS public domain and commercial software that has been around for some time, there is still quite a bit of new software being released for the H-89. Among the firms specifically targeting the 8-bit Heath users with modest price software (prices are as of 12/86, and do not include S&H) are:

a) Sunsoft, Inc. with their Abacus accounting software at $69.95.

b) Wheeler Associates, Ltd. with a $9.95 program, ZCPR-IN, that automatically installs complex ZCPR3 configurations on a CP/M system, saving hours of tinkering for the average user, and also a ZCPR utilities disk for $8.00.

c) Spectre Technologies, Inc. who are selling Twist & Shout, a sideways and banner printer driver program for $34.95, and Milestone, an engineering and/or business critical path project manager for $99.95.

d) Skycastle Computer Products, with a competing banner program for $19.95, and an H-89/H-19 graphics dump program for $24.95.

e) The Software Store, with its Mastercom telecommunications package for $49.

There are a great many more of these, but this will give a fair sample to demonstrate that people really are releasing new programs for the 8-bit machines. They ARE almost entirely for CP/M, though; new HDOS software is hard to find, as it's a much more limited market.

Besides hardware and software, there are still several publications covering the 8-bit Heath/Zenith world. Although the 16 bit machines more or less dominate the commercial magazines like *Sextant*, they still do publish quite a bit of stuff for the Greyboxers. Club newsletters, especially from the big regional HUG groups in college towns and the Midwest, seem to have a majority of 8-bit subscribers, or least they're a big, noisy minority. Ham radio publications are another good source of information, as there are a lot of ham Heath fanatics, and many of them are intensely interested in 8-bit AMTOR, RTTY, and packet applications.

Quickdata, Inc., publisher of the commercial newsletter, *H-SCOOP*, has a long-standing policy of supporting 8-bit Heath users, and of independence from pressure by commercial advertisers.

A new newsletter, the *SEBHC Journal*, is now coming out monthly from Plain English Services, of Ann Arbor, Michigan. Len Geisler, the publisher, says his subscriber base is a mixed bag, about evenly divided between new users who have just bought a second-hand H-89, and grizzled old-timers from the pioneer days.

8-bit Heath Support Addresses for "The Next Greybox Generation":

Magnolia Microsystems, Inc.
2820 Thorndyke Ave. West
Seattle, WA 98199
(206) 285-7266

TMSI, Inc.
366 Cloverdale
Ann Arbor, MI 48105
(313) 994-0784

CDR Systems, Inc.
7210 Clairemont Mesa Blvd.
San Diego, CA 92111
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Three From Maxisoft continued from page 291

mation contained in ranges of cells. This can help in data entry, since mistakes are more obvious when heard. It does require 30,000 characters of memory space, so it limits the size of the worksheet.

As with other full-featured spreadsheet packages, MaxiPlan requires at least 512K to run properly. In this configuration, it can handle a worksheet 512 rows by 16384 columns. Inserting rows or columns into the spreadsheet is possible, but you may lose any information contained in the outermost row or column.

While it uses the menu capabilities of the Amiga, MaxiPlan also has many commonly used commands on the function keys. By using both the regular and shifted keys, they get 20 commands including cut, copy, paste, change screen colors, print, save, clear, draw chart, specify chart, select cell, insert row and column, select last cell, fill right, fill down and calculate now. This last is used when auto-recalculate is turned off.

Data can be specified as general, dollars, fixed, date, or time. Each cell can have the decimal places, commas, pen color, width, alignment and print style (normal, bold, underline, italic or any combination thereof) set. Cells can also be protected so that data or formulae cannot be changed inadvertently. These settings can be applied to ranges of cells as well, making it easier to put large sections of a sheet in similar format. Ranges can be named for easy reference.

Cursor movement is accomplished in a variety of ways. Point and click with the mouse can be used on the immediate screen. You can also use the WordStar diamond pattern (Control S, D, E and X). You can use the scroll gadgets to move long distances. And control RETURN will take you to the first column of the next row. Using the control keys with the arrow keys moves the cursor to the last active cell in the indicated direction.

A special feature of the latest release is the zoom display mode. The entire worksheet is displayed in miniature, each cell being one character wide by two lines high. In this mode

continued on page 296

Add-Ons For The Blind

If someone you know is visually impaired and interested in computers, you'll want to tell them about a book that looks at all kinds of peripherals that make computers accessible to visually impaired users. The book is, *Add-Ons: The Ultimate Guide to Peripherals for the Blind Computer User*, published by National Braille Press.

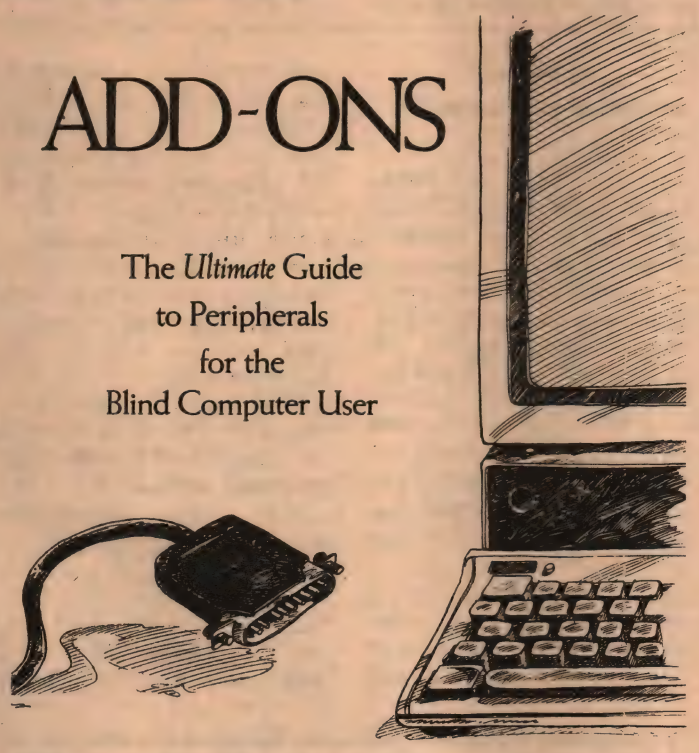
This fast-paced book discusses peripherals such as scanners, modems, inkprint and braille printers, speech synthesizers, and paperless braille devices, plus all the little tricks and toys that make systems "friendly." *Add-Ons* is determinedly non-jargoned and comprehensive.

Perhaps the most unique feature of the book is that the product reviews contained in the book were all written by blind users—the people who know these products best. They discuss features that directly impact on a visually impaired user—such things as out-of-paper alarms on printers, hand-held scanning devices, speech screen review, and so forth.

Even better, the reviewers are available, by phone or correspondence, to assist people in getting started or simply in selecting the right system. Working as attorneys, marketing managers, writers, programmers, analysts, teachers, and in other professions, the reviewers offer free consulting services that span a wide array of applications.

The National Braille Press ensures access to the information in the book by making it available in three media: print ($19.95 including postage); braille ($16.95 free matter shipping); tape ($16.95 free matter shipping). *Add-Ons* is available from National Braille Press Inc., 88 St. Stephen Street, Boston, MA 02115; (617) 266-6160.

Mention that you read about it in *Computer Shopper*. ●



Books On Excel continued from page 293

master of Excel." While this book will certainly teach you how to use Excel's features, there are books that better illustrate how to design Excel applications. *Advanced Excel* offers a little advice on designing spreadsheets for specific purposes. But mostly it sets up examples and expects you to extrapolate on them.

Despite this, I can recommend the book to those wanting to get more from Excel. The functions and macro command summary at the end is a most useful reference tool as the entries are categorized by usage rather than being a simple alphabetic listing.

With the 20 applications it includes, it isn't a bad buy. I would have liked to see TAB or the author offer a $10 disk with the applications already on it, but I suspect that entering in the samples would enhance the learning aspect of the book.

As you can see from these four samples, there are a variety of books available about Excel. For those who aren't terribly experienced with using spreadsheets, these are usually good buys. Most of them can be found in your local Walden Books or B. Dalton Bookstores. ●

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Amiga Genlock Peripheral Interface To VCR

Commodore Business Machines, Inc. has expanded the capabilities of the Amiga personal computer with the introduction of the Genlock 1300 video synchronizer. The Genlock 1300—the first consumer-priced, stand-alone computer genlocking device of its kind—can synchronize an external video signal from a VCR, camera or videodisc player with text, sound and graphics generated by the Amiga computer.

Easy To Use, Affordable

The Genlock 1300, an electronic outboard device, allows users to superimpose Amiga's sophisticated computer-generated graphics, animation, stereo sound and titles over videotaped images generated by video equipment ranging from video cameras to consumer VCRs, videodisc players and camcorders—a task previously relegated to equipment costing much more. The Amiga Genlock 1300 brings the capability of video mixing to Amiga users in an easy to operate, affordable format home enthusiasts, as well as serious videophiles, can enjoy.

"We've introduced a peripheral that will give every Amiga user who wants it the opportunity to take computer-generated graphics a step further into a dimension previously unavailable to them because of prohibitive cost," stressed Nigel Shepherd, general manager, Commodore North America. "We anticipate this will create a whole new generation of users in all areas—business and artistic endeavors, as well as increase consumer enjoyment of both computer and video equipment."

Many Applications

The resulting product—synchronized graphics—can be displayed on a monitor or TV set, or recorded on videotape with many potential applications. Businesses can utilize the superb Amiga graphics and processing power to create video presentations for sales and training applications. Animation software can be used to produce promotional videos for advertising or display work. Even home users can enhance self-produced personal videos with sound, titles and animation using the Genlock 1300.

Multi-Functional Input, Output Ports

Powered through the Amiga, the 2.5 pound Genlock 1300 fits neatly—and unobtrusively—into the Amiga chassis. Genlock 1300 connects to the RGB port of the computer's main console. The input ports accept an RS-170 composite signal, stereo audio lines and an Amiga computer signal. The outputs include both composite and RGB videos as well as a stereo audio signal. The peripheral controls adjust source hue, the position of the video under the Amiga computer graphics, the balance of the Amiga audio against the external signal and an interrupt audio source switch.

Now Available

Since its introduction a year and a half ago, the Amiga has extended the limits of computer-generated graphics for artists who use the visuals in a wide range of applications. The Genlock 1300 is another step toward bringing Amiga users "total control" over the graphics they create. Genlock 1300, which is now available for sale, has a suggested retail price of $195.00.

For more information contact Commodore Business Machines, Inc., 1200 Wilson Drive, West Chester, PA 19380; (215) 431-9100. ●

Three for Maxisoft
continued from page 295

you can then highlight ranges easily, or click on any cell to examine it's contents. Clicking on a cell makes it the upper left corner of the active window when you return to normal mode. This is a very fast and accurate way to move the window.

Formulae can use all the normal math operators and many functions are built-in, including ABS, ACOS, ASIN, ATAN, ATAN2, AVERAGE, CHOOSE, COS, COUNT, DAVERAGE, DAY, DCOUNT, DMAX, DMIN, DSTDEV, DSUM, DVAR, ERR, EXP, FUTURE VALUE, HLOOKUP, IF, INDEX, ISNA, LN, LOG10, LOOKUP, MAX, MIN, MOD, MONTH, NA, NOT, NET PRESENT VALUE, OR, PI, PMT, PRESENT VALUE, RAND, ROUND, SAY, SIGN, SIN, SQRT, STDEV, STYLE, SUM, TAN, TODAY, VAR, VLOOKUP, WEEKDAY, and YEAR. With all these, the program is quite flexible. Formulae can be typed in or the mouse can be used to point to math symbols at the top of the screen. Cell references in formulae can be relative or absolute.

Data from sheets can be graphed as bar, line, pie or area charts. These can then be saved in a format compatible with Deluxe Paint if more detail is to be added. Charts also can be printed from within MaxiPlan.

My only complaint about the program is the documentation. I would have liked to see more useful tutorial information. The fact that the two-page index is almost adequate indicates how much information is missing from the manual.

Though initially offered with a "key disk" copy protection scheme, MaxiSoft has reconsidered and now offers the program in unprotected form. ●

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rent breakpoints and allows you to change these, "C"hange allows you to change the value of any numeric variable, "G"raphics will allow you to choose to examine the definitions of either characters, color, or sprites, "L"ist allows you to list any range or program lines, "P"rogram will tell you which line is currently executing, the ON ERROR line number (if present), and Option Base, and "V"ariables lists variables with their current values. There is even a built-in math calculator accessible from the command prompt. Once you have peaked around and changed the program as you would like, hit SHIFT-CTRL again, and the XB:BUG goes back into hiding and the XB program continues from where it was stopped. XB:BUG takes up a minuscule 5 kilobytes and comes in versions to load it into either high or low memory. The documentation that came with the submission was excellent and several demo programs were sent with printed instructions on using XB:BUG with these programs. It was a joy to use and investigate some programs with. This utility will soon, as I understand it, be available for purchase (try Disk-Only Software, P.O. Box 244, Lorton, VA 22079). When it is, and if you program at all in Extended BASIC, buy it. It will make your task much the easier.

A Real PAL...

Some time back, I came right out and said that I thought Joypaint 99 (Great Lakes Software, 804 E. Grand River Avenue, Howell, MI 48843; $49.95) was the best graphics program available for the TI. I still believe that. Now, Ernest Chandler and his folks have made the package even better. With the release of Joypaint PAL ($9.95), Joypaint can now use screens from Graphx, TI Artist, and Great Lakes' own Extended Business Graphics. Further, the PAL

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allows printouts to the hard-to-print-to Axiom GP-100 printer, and a facility to reduce objects by half. A nice utility and it adds all the features I missed in Joypaint itself. Also, Great Lakes has released a second disk of Clipart ($9.95). Does my heart good to see a company not only release a marvelous program, but continue to support it and even enhance its usefullness to the consumer and for such a modest cost. Hats off to Great Lakes. Highly recommended.

Still Kicking...

Despite the fact that Jim Peterson (Tigercub Software, 156 Collingwood Avenue, Columbus, OH 43213) has discontinued the famous "Tips" series (after over 40 months), he is still selling his incredibly cheap, ingenious and innovative BASIC and Extended BASIC software (some 130, all for $3). One of the Tigercub's biggest successes (besides his "Tips from the Tigercub" on disk, Volumes 1-4, $15 each/$42 for all four) has been his "Nuts and Bolts" series. This collection (I and II, $19.95 each, $37 for both) has served Extended BASIC programmers well—increasing productivity and ease of programming. These disks contain 100 subroutines each, all in D/V163 file format—ready to merge right into your existing program to enhance it in any of, well, a hundred ways. Containing everything from screen wipes (clever ways to clear the screen), to character fonts to enhance your displays, to math routines, sorting routines and sound effects. If you program in Extended BASIC, you need this toolbox of routines. By merging these into your code and using the CALL SUB routine commands, you can double or triple the time it takes you to construct a polished program. I love this software not just because it is well-done and extensively documented. I love it for what it represents—a return to programming. There are no high scores, windows, screaming meanies, or aliens near this disk. This disk is for programmers. Beginners and experienced hackers, alike. Whether you are writing your first or your first hundred programs, these subroutines are fundamental. They are the building blocks for your ideas. They are not ideas themselves—they are but bricks in the wall. You supply the cement and Voila! A program—your program. Yours and Jim's—but Jim will let you take the credit. Check out Tigercub Software soon.

Delphi's TI Information Network...

This service continues to grow and promises even more things in 1987. Jeff Guide has taken over as the Head Sysop of that system and, being a strong TI 99/4A user, he promises to build the TIIN into a major force. Art Byers, a member of the "99 Professional Council," has also put together a marvelous "help disk" that contains tutorial files on how to use Delphi in general and the TIIN specifically, as well as containing the public domain Xmodem protocol for the TI (by Paul Charlton) to help you immediately get started downloading the excellent software offerings on the Network. Art did a terrific job on this disk and makes it the best introduction available for any electronic system. Once you have subscribed to TIIN, you can contact Art (username "ARTBYERS") on how to get your copy. For more information, contact Delphi at (617) 491-3393.

The Mystery Is Over...

On January 16, MG announced their new hardware venture for the TI. The MG-Triton (that is right, Triton is the "major American firm" that bankrolled this product) offering, dubbed the "TurboXT Personal Computer," will be two hardware and one software products. The hardware products will be, first, an "interface" or "bridge" box that will plug into the side port of the 99/4A into which one would plug the /4A video, the monitor is hooked to (via RF modulator or direct video cable) it along with the PC-XT video and the PC-XT keyboard cable is hooked into the box. The peripheral expansion box's beloved "firehose" connector will also be plugged into the bridge box. The second hardware will be, simply, a PC-XT expansion box with 256K, a DS/DD controller, a compatible disk drive and 8 expansion slots. The 8088 chip will run at a clock speed of 4.7 Mhz (the traditional PC speed) or 8 Mhz, the increasingly popular "turbo" speed. The software product allows the TI to emulate a PC keyboard and, by pressing Function-Control-Enter, one is able to switch from XT-mode to TI-mode. (According to MG, this product was the most difficult to produce—to have the TI keyboard "emulate" an XT keyboard. The actual design of the interface box took less than a month). Further, one can do a form of "multitasking" in that one could start a task on the XT (a database sort, or a file download via modem, and switch to TI-mode and perform some function or task there (the reverse is not possible). The devices will be both 100 percent TI as well as XT-compatible. Further, MG confirmed to me that with just a black and white television, the XT-mode will be able to display 80 columns and even run some graphics-based software (e.g. "Flight Simulator"). No, Virginia, you cannot get 80 columns in the TI-mode. Total price is $499 plus $18 or so for shipping and handling. One of the nicer features of the machine is a liberal 30 day "money back guarantee," a one-year parts and labor warranty as well as an optional extended warranty of 3 years available for an additional $99. Triton also offers MSDOS and utilities and a tutorial for $69.95. The software package includes a text editor, calendar, and a terminal emulator. Product delivery is slated for March, 1987. The delivery date appears firm. You can get further information from Triton by

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The Silver Box
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outlined above was a little more subtle but apparent enough to let you see what's wrong. The MSDOS requires an "$," the dollar sign, at the end of a character line. Without it, the DOS will not stop printing. The program has many message strings without it and only two had the required dollar sign at the ends. I didn't notice this until I assembled and linked the file and ran it. At first, it printed a string of garbage and crashed. The DS register was not aligned properly and the pointer was pointing to a body of codes rather than to a message string.

I fixed it by aligning DS with the CS register since the message section was within the CS Code Segment declared as "public" code. The sequence of PUSH CS, POP DS will do it. The MASM, as you may have read somewhere, aligns DS register 10H more than the CS register automatically if it is an EXE file. Without the above pop and push sequence, the DS will be pointing to an erroneous location.

I should have known better but when I assembled and ran the program the second time, it printed a potpourri of messages followed by colorful symbols, an indication of runaway printing! This happens any time when you forgot to put the dollar signs at the end of the message string, a common error in an assembly routine. I scan the message section with the EDLIN but quickly switched to the New Word, the word processor I use. (This word processor is the forerunner of the Wordstar Version 4.0.) EDLIN complicates things when you are just adding or deleting a symbol or two, but in many lines. Word processors usually can handle this type of job nicely, providing if your word processor program can work on a pure ASCII files.

I reassembled it and ran. The computer went into a deep freeze and nothing less than the little black switch (the rest button) can de-freeze it. I loaded the SMDB with the MOVE.EXE. (I renamed the SYMDEB. It facilitates wuick typing. Remember, both MASM and LINK have four characters each as their names. Since the program name has the same length, you just type the name and push PF3. Viola, you get the target file name without retyping the whole name.) I traced point to point makin gsure the CPU is responding to my commands. At the very end of the program, the CPU did not come back to the address zero of the code segment. The location always has the Interrupt 20H, the code "CD20," which returns you back to the operating system.

I don't remember exactly what I did there. The idea is to keep the original Data Segment value somewhere you can access when needed; in one of the registers or in a memory location. In this program the ES Register keeps the original DS value to the end of the program. I pushed the ES register followed by AX register holding 0000. You can load the AX register with immediate value of 0000 and push it. Some people want to XOR the AX which invariably clears the contents of the AX register to all zero, but this method clears flags as well. After these two pushes, you can do RET(urn) FAR. The instruction RET FAR picks up two 16 bit Words in the Stack. The CPU puts the value pushed before the last in the Program Address register IP and the value pushed last in the CS Register. This is, in strict sense, a faked far jump rather than a true return operation.

The program has no menus as other 1970s and early 1980s vintage programs do. You have to type in parameters when you call the program. The XMODEM.ASM copy I mentioned earlier had many of available parameters disabled or unimplemented and the selection was, in my opinion, totally inadequate. The program is quite elusive that if you miss the selection of parameters, it jumps back to the operating system doing nothing showing nothing, or, if you looked through the source list and found the special parameter for examples and used it, the program will give you some confusing hints and jumps back to the DOS. Besides, the present program initializes the serial port in just one format only.

I set out to rewrite most of the action routines using a straightforward menu system with some added features like format selection. Of course, the existing routines are for the IBM hardware and I patched in half a dozen IF SANYO...ENDIF and IF IBM... ENDIF structures to accommodate both Sanyo and IBM hardware. The work may be finished in a couple of months if the Almighty had given me the chance. You may see the result in this column in the near future.

The QMODEM

The QMODEM communication program is a complete communication program with everything you need. This is not a public domain program in real sense. It's a shareware. The program asks you to send a donation. Donation? What donation? This is a misnomer for a straightforward sale based on trust. The program is written and compiled using the Turbo Pascal, but furnished without the source code. It works fine in the clones but does not do anything when you run it on Sanyo because the serial port interface routine is specifically written for the IBM hardware.

I have identified most of the input/output routines. The task now awaiting me is to rewrite the interface routines for the

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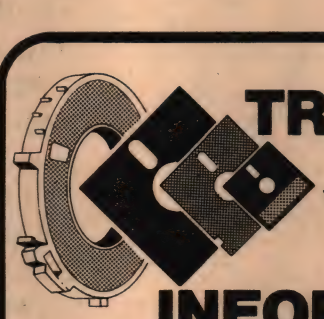
calling them at 1-800-227-6900.

Newsletters Received And The Fairs...

The mailbox runneth over and thanks to West Jax 99'ers (P.O. Box 176, Orange Park, FL 32067), the TIC-TAC Users Group (812 S. 132nd, Seattle, Washington 98168—winner of the "Newsletter of the Month" award; newsletter subscriptions $6/year), the Houston Users Group (13107 Bafing, Houston, TX 77099), and the Penn-Ohio Users Group (71 Elm Street, Struthers, OH 44471). Special thanks to Charles Good, the librarian of the Lima 99/4A Users Group (2225 High Ridge, Lima, OH 45805) and Jim Susco of the CIN-DAY Users Group (416 Pinewood Avenue, Piqua, OH 45356) who sent a nice collection of their groups' excellent newsletters. Again, if you don't belong to a users group, join one. The Second Annual LA TI Fest will be held May 16 and 17. Write the LA Users Group (148 S. Maple Drive, Beverly Hills, CA 90212) for details. Last year's event was super and this year promises to be an even bigger happening. TICOFF '87 will be held March 28 (Art Byers, Coordinator, c/o Roselle Park HS, 185 Webster Avenue, Roselle Park, NJ 07204) and the New England fair will be held the following weekend, April 4. Write BCS, TI User Group, One Center Plaza, Boston, MA 02108).

Will Wonders Ever Cease?

There are rumors about that we may be getting one of the early production models of the Myarc 9640 computer for review. If it comes to pass, you, the readers, will get a thorough look at one upgrade path for the 99/4A. Keep your fingers crossed. ●



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AUTODEX—Public Domain Disk Utility

by Fred Blechman

You got your computer to get yourself organized. But, if you're a typical software junkie, by now you have dozens of disks full of meaningless file names!

Don't feel alone—but if you use an IBM PC or compatible, or a Sanyo MBC 550 or 555, there's hope. AUTODEX to the rescue! This public domain program, available from computer bulletin boards and user group librarians all over the country, will allow you to type a description (up to 42 characters) for each file name.

```
                    * A U T O D E X (1.8) *
  * DISK AREA *  | Sort  Mult  | Current: A   Backup: B     Date: 012886
Disk Left:  15K  | Exit  FLst  |                             Id: BOOT
File:  1 of  38  |
  * FILE AREA *
CMD   Name  Type | Size | ChgDte  | Description
=>  --BOOT  DID  |  3K  | 012886  | Autodex description file for this disk
    AMLOGO  BAS  |  2K  | 010786  | AMBIZ-PAK logo
    ANSI    SYS  |  2K  | 070786  | ANSI standards
    AUTODEX DOC  |  3K  | 010188  | Instructions for Autodex
    AUTOEXEC BAT |  1K  | 010188  | STARTUP BATCH FILE
    AX      BAT  |  1K  | 012886  | Batch file to start AUTODEX
    AXX     EXE  | 32K  | 091186  | AUTODEX FILE
    BASICA  EXE  | 53K  | 020883  | SANYO BASICA
    BOXFILL BAS  |  1K  | 122986  | BASIC program to draw and fill box
    CLOCK   EXE  |  2K  | 050786  | SETS CLOCK
    CLRCOMB BAS  |  1K  | 012586  | BASIC color combinations
    CLRTEST BAS  |  1K  | 011186  | BASIC color combinations
    CLRWHEEL BAS |  1K  | 122986  | BASIC graphics (Sanyo)
    COLOR   BAS  |  1K  | 122986  | BASIC color (Sanyo)
    COLORBAR BAS |  1K  | 012787  | BASIC color combinations
    COLORS  BAS  |  1K  | 010188  | MONOCHROME "COLOR" EFFECTS
    COMMAND COM  | 24K  | 070786  | COMMAND.COM - IBM PC
    CONFIG  MOR  |  1K  | 111486  | Configuration file sample
                                    ©FRED BLECHMAN 1987
```

Fig. 1—Typical AUTODEX screen.

You can certainly describe a file a lot better with 42 characters than you can with just eight!

Every time you use AUTODEX your directory will appear, sorted, and with your description after each file name. You'll also be able to copy, erase, print, view, and even execute files, all with simple commands.

But there's a catch! There doesn't seem to be any documentation describing how to use AUTODEX properly. At least, I haven't found any. This article is the result of my own experimentation, and discussions with several users. It should allow you to exercise most of the power available in AUTODEX. And, if you can't find AUTODEX, or don't know how to download it from a bulletin board, at the end of this article I'll give you sources for a disk for only $5.

Caution!

There are only four simple rules to remember when you use AUTODEX:

(1) You must enter the program through a special batch file called AX.BAT.

(2) You must exit the program through AUTODEX's EXIT command.

(3) For some functions, you must have COMMAND.COM on your disk.

(4) When in doubt, press the ESCape key!

I don't find any provision for path commands in AUTODEX, so I don't think it can be used for hard disk operation.

Starting AUTODEX

In order for AUTODEX to perform properly, you MUST enter the program from its batch file, AX.BAT. This is a simple file that merely calls the AXX.EXE file—the actual AUTODEX program—and allows you to specify a drive or path. When you start AUTODEX this way, you are in the batch mode.

This is important because several AUTODEX operations return to DOS functions after creating a modified batch file. Since you are in the batch mode, the computer looks for this batch file, which reflects your last AUTODEX command.

If you don't start from the batch file by simply typing AX at the keyboard (and then pressing the down-left arrow ENTER key), you will simply exit to DOS when you issue some AUTODEX commands. So, don't try to run AUTODEX by using the program name AXX. Just use AX. And be sure the disk in the default drive contains AX.BAT and AXX.EXE.

AUTODEX Screen

Look at the neat display you get with AUTODEX, as shown in Figure 1. As you can see, the version I use is 1.0. There may be later versions. The top four lines of the display are called the DISK AREA. On the left side you see how many thousands of bytes of memory are left on the default disk, how many files are on the disk, and which file number (sorted alphabetically in ascending order) is highlighted in reverse video on the main area of the screen.

The rest of the top four screen lines show Sort, Mult, Exit, FLst, Current, Backup, Date and Id. By pressing the

continued on page 302

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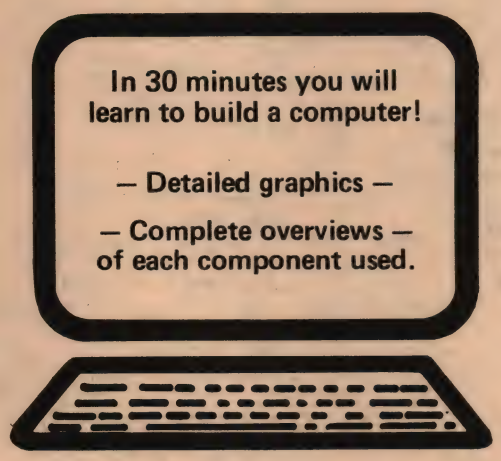

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The Silver Box continued from page 298

Sanyo hardware and fit them neatly in the space available for them. Not a formidable task but I could not finish it by the closing time for this column.

QMODEM is a full-fledged communication program. You can set the port for most of the formats you might encounter in most data communications. It has a phone directory which you can edit. You can dial manually or from the list. The only problem is that it doesn't interface with the Sanyo hardware.

The Taming Of The SKM

I own SideKick Version 1.56A, the protected version. I bought the protected version for fun and I think I did the right thing, because I now know that the SideKick does operate on some devices, other than the CRT controller in manipulating the screen. The interface done by the SideKick may or may not interfere with the operation of Sanyo, but I managed to crash the system many times, with or without the help of the SKGO patch. The SideKick Version 1.56A worked fine in my clone but it never worked in the Silver Box, my Sanyo MBC-555, until I patched it.

One problem with SideKick is that it is a hefty program. It occupies lots of memory when loaded. The smallest three function SideKick module I have, the SKM.COM, occupies 26K when loaded. This size is still not too comfortable for my 732K Silver Box. The only resident program I use is the Turbo Lightning. With 400K RAM disk I have about 160K RAM area and about 90K left in the RAM disk to operate after all the application programs I need for word processing loaded in place. This is the situation I have at the moment.

My neighborhood genius, Mr. Homes, loaded SKM.-COM using the DEBUG. You could use SYMDEB if you have one. He jumped from one call to the other, checking each jump and call to see what it does looking at the screen and the registers. We found out the program reads a bad sector in the track #6, checks the error bit, the 7th bit in the AL register, to see if seek error has occurred. If it did not detect the error bit, the program terminates the operation. Mr. Homes said this is probably the copy protection check used by the program.

Then we arrived three sections of subroutines which deal with some non-existent device ports in the Sanyo. These are at 25F1H, 45C3H and 45C8H. These check one or the other bit of the value read from the ports until conditions are met. Since these read non-existent ports the bit pattern may not change, and the conditions may not be met. These become trap routines in the Sanyo. We skipped these by jumping around them.

At 45F0H, he faked byte pattern in certain part of memory used as DMA area, a disk read buffer zone, writing data "F6" and "F7." He did not explain fully, but, I supposed that these were the key data stored in the bad sector.

Next, at address 4697H, my Silver Box froze again. Mr. Homes found out that this is where the DMA interface routine resides. We do not have any DMA chip in Sanyo and the port address coincides with some other port in the Sanyo, this routine does nothing but cause a halt in operation. We skipped here. Similar routines was encountered at address 46E3H. We skipped it and routines at 470B and 472CH.

He put all the changes in an ASCII file called SMOOT-156.ASC. After putting the SKM.COM through this treatment, the Version 1.56A functions fully without a trace of impediment on my Silver Box! With full color, so vivid and beautiful, that occasional use is a real pleasure. If you are a rightful owner of the SideKick Version 1.56A, I invite you to try Mr. Homes' little configuration. The listing will appear next month in this column. ●

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AUTODEX
continued from page 300

ESCape key, your cursor will move up to this area of the display and highlight one of the above statements. We'll get to what they do later.

The FILE AREA is the remaining 21 screen lines, showing up to 18 file names per "page." The CMD (Command) column shows an arrowhead cursor next to the highlighted file name. The Name column identifies the file name, and the Type column shows the file extension. Not shown, but understood, is a dot (period) between the name and type (unless the type is blank). The approximate file size is shown in kilobytes (thousands of characters) in the Size column, with the latest change date in the ChgDte column. Hidden files do not show at all.

Unless you've used AUTODEX before, the Description column is blank—but not for long. It's real easy to add descriptions for each file, which we'll be doing shortly.

File Selection

To change the highlighted file name, use your cursor (arrow) keys. Press the down-arrow and watch the highlighted bar move down with each stroke. Hold the key down and you get fast repeat action. Or you can do the same with the ENTER key. The up-arrow moves the highlighted bar upward. If you have lots of files, use the PgDn key for the next page, and the PgUp key for the former page. The Home key returns you directly to the first file at the top of the first page. The End key takes you to the last page. Neat, huh? You ain't seen nuthin' yet.

Adding Descriptions

It's really simple to add a description, up to 42 characters long, for each file name. Move the highlight bar to the file name you want to describe. Now press the right-arrow cursor key. The cursor jumps over to the Description column. Now simply type the description. While you can't insert characters, you can backspace, change and use the SPACE key to delete or put in blank spaces. Simple. When you're done, press the ENTER key and the cursor goes back to the command (CMD) column. This description will be held in a special data file created when you exit AUTODEX properly.

But wait! Before we go any further, you have to give this disk a name—an Id (Identification)—in order for the description file to have a name. You do this by pressing the ESC key. This moves your cursor to the top lines of the screen—the DISK AREA—and highlights Sort (or the last used command or statement if you were in this area before).

Using your cursor keys again, move the cursor until it is on top of Id and press ENTER. Now type in a disk identification name or number, up to a maximum of six characters, and press ENTER. This is not a volume label for the disk, but a file name for the description file, "– –XXXXXX.DID," with the XXXXXX replaced by the name you just gave it. This file will be created when you exit AUTODEX, and will contain all your file descriptions.

I suggest you organize your disks by type (programs, utilities, text files, data, etc.) and give each a number series, such as 100-199. If your disks are like mine, they are full of

continued on page 304

```
                    * A U T O D E X (1.0) *
 * DISK AREA *  | Sort  Mult | Current: A   Backup: B     Date: 012886
Disk Left:  15K | Exit  FLst |                             Id: BOOT
File:  1 of  38 |
 * FILE AREA *
CMD  Name  Type | Size | ChgDte | Description
  --BOOT   DID     3K | 012886 | Autodex description file for this disk
  AMLOGO   BAS     2K | 010786 | AMBIZ-PAK logo
  ANSI     SYS     2K | 070786 | ANSI standards
  AUTODEX  DOC     3K | 010180 | Instructions for Autodex
  AUTOEXEC BAT     1K | 010180 | STARTUP BATCH FILE
  AX       BAT     1K | 012886 | Batch file to start AUTODEX
  AXX      EXE    32K | 091186 | AUTODEX FILE
  BASICA   EXE    53K | 020883 | SANYO BASICA
  BOXFILL  BAS     1K | 122986 | BASIC program to draw and fill box
  CLOCK    EXE     2K | 050786 | SETS CLOCK
  CLRCOMB  BAS     1K | 012586 | BASIC color combinations
  CLRTEST  BAS     1K | 011186 | BASIC color combinations
  CLRWHEEL BAS     1K | 122986 | BASIC graphics (Sanyo)
  COLOR    BAS     1K | 122986 | BASIC color (Sanyo)
  COLORBAR BAS     1K | 012787 | BASIC color combinations
  COLORS   BAS     1K | 010180 | MONOCHROME "COLOR" EFFECTS
  COMMAND  COM    24K | 070786 | COMMAND.COM - IBM PC
  CONFIG   NOR     1K | 111486 | Configuration file sample
  CONFIG   RAM     1K | 122686 | Configuration file sample
  CONFIG   SYS     1K | 111486 | System configuration file
  FREDTEST BAS     1K | 122886 | CGA graphics test
  GRAPH1   BAR     1K | 010180 | Data for graph program
  GWBASIC  EXE    78K | 070786 | PC GWBASIC 3.2
  INVOICE  ASC     9K | 010286 | Text file for INVOICE.NEW program
  INVOICE  BAS     8K | 010180 | New INVOICE program
  JEFFTEST BAS     1K | 010180 | CGA graphics test
  MENU     BAS     2K | 010180 | AMBIZ MENU PROGRAM
  MODE     EXE    14K | 070786 | DOS Mode file
  MSDOS2   ASC     4K | 010180 | SAMPLE ASCII TEXT FILE (ARTICLE ON DOS)
  ORDERVRF BAS    10K | 010180 | AMBIZ ORDER PROCESSING
  ORDERVRF DAT    12K | 120985 | AMBIZ ORDER DATA FILE (ASCII)
  PCCOLOR  BAS     2K | 010486 | CGA graphics test
  PCCOLOR  COM     1K | 010486 | ????????
  PRINT    COM     9K | 123085 | DOS print spooler
  RAMDRIVE SYS     7K | 070786 | Sets RAM disk
  TEST     BAS     1K | 122686 | ??????
  TESTBOX  BAS     1K | 122986 | ??????
  XCLRTEST BAS     1K | 011186 | ???????

 ** DISK Commands **          ** FILE CMD's **
 Sort    = Sort Filenames     ? = Display File CMD's
 Mult    = Bkup, List, Erase  B = Backup file
 Current = Current Drive      C = Copy file
 Backup  = Backup Drive       E = Erase file
 Date    = Today's Date       G = Goto file
 Exit    = Exit AUTODEX       L = List file
 FLst    = List file Info.    M = Mark file for Mult
 Id      = Identify Disk      N = Next screen
                              P = Previous screen
 ** MISC Commands **          R = Rename file
 (ESC) = Escape from action,  T = Make this top row
         or where you are     V = View file
                              X = eXecute program

 012886 | COMMAND.COM - IBM PC
 111486 | Configuration file sample

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```

Fig. 2—Shift ? provides 2 HELP Screen.

```
AUTODEX File List: 012987     Id: BOOT      Disk Left:    15K bytes

Filename        Size   Change Date   Description
------------    ----   -----------   ------------------------------------------

--BOOT   DID      3K      012886     Autodex description file for this disk
AMLOGO   BAS      2K      010786     AMBIZ-PAK logo
ANSI     SYS      2K      070786     ANSI standards
AUTODEX  DOC      3K      010180     Instructions for Autodex
AUTOEXEC BAT      1K      010180     STARTUP BATCH FILE
AX       BAT      1K      012886     Batch file to start AUTODEX
AXX      EXE     32K      091186     AUTODEX FILE
BASICA   EXE     53K      020883     SANYO BASICA
BOXFILL  BAS      1K      122986     BASIC program to draw and fill box
CLOCK    EXE      2K      050786     SETS CLOCK
CLRCOMB  BAS      1K      012586     BASIC color combinations
CLRTEST  BAS      1K      011186     BASIC color combinations
CLRWHEEL BAS      1K      122986     BASIC graphics (Sanyo)
COLOR    BAS      1K      122986     BASIC color (Sanyo)
COLORBAR BAS      1K      012787     BASIC color combinations
COLORS   BAS      1K      010180     MONOCHROME "COLOR" EFFECTS
COMMAND  COM     24K      070786     COMMAND.COM - IBM PC
CONFIG   NOR      1K      111486     Configuration file sample
CONFIG   RAM      1K      122686     Configuration file sample
CONFIG   SYS      1K      111486     System configuration file
FREDTEST BAS      1K      122886     CGA graphics test
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INVOICE  BAS      8K      010180     New INVOICE program
JEFFTEST BAS      1K      010180     CGA graphics test
MENU     BAS      2K      010180     AMBIZ MENU PROGRAM
MODE     EXE     14K      070786     DOS Mode file
MSDOS2   ASC      4K      010180     SAMPLE ASCII TEXT FILE (ARTICLE ON DOS)
ORDERVRF BAS     10K      010180     AMBIZ ORDER PROCESSING
ORDERVRF DAT     12K      120985     AMBIZ ORDER DATA FILE (ASCII)
PCCOLOR  BAS      2K      010486     CGA graphics test
PCCOLOR  COM      1K      010486     ????????
PRINT    COM      9K      123085     DOS print spooler
RAMDRIVE SYS      7K      070786     Sets RAM disk
TEST     BAS      1K      122686     ??????
TESTBOX  BAS      1K      122986     ??????
XCLRTEST BAS      1K      011186     ???????

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```

Fig. 3—Typical AUTODEX printed directory.

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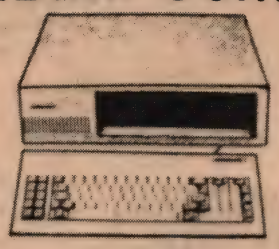

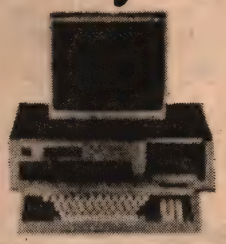

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AUTODEX
continued from page 302

all kinds of files, so you may just start with 001. You can also use description titles, like UTIL01—up to six characters. Later we'll cover a command that will let you print the directory of each disk, with file descriptions.

Pressing the ESCape key toggles you back and forth between the DISK AREA and the FILM AREA. Whenever you seem lost, press the ESCape key.

HELP And DISK AREA Commands

Any time your cursor is in the FILE AREA (not the DISK AREA), you can press SHIFT ? and you'll get a large HELP screen that lists all the disk and file commands, with a brief description of each, as shown in Figure 2 on page 302.

First we'll cover the disk commands, all of which are shown in the DISK AREA of the screen. To invoke the command, move your cursor on top of it and press ENTER. Most will generate an action message, just as we did a moment ago with the Id command.

When you use the Sort command, you'll be asked to select from Name, Type, Size or ChgDte. Put the cursor on the one you want and press ENTER, and the display now shows the files sorted as you requested. Name and Type sort alphabetically in ascending order (from the top down), Size sorts largest first, ChgDte sorts by latest date first.

The Mult command is intended to allow you to perform the same function (Backup, List or Erase) on previously "marked" files. You may have problems with this, for various reasons. If you intend to use it often, test it out on some non-critical files. Otherwise, I'd suggest you steer clear of this command. I've been told it works, but when I tried it I got keyboard lockup. Could it be my clone XT BIOS? Or perhaps I didn't have COMMAND.COM on the disk. Anyhow, be careful with this one.

Be sure to use the Exit command when you are ready to leave AUTODEX. This creates the entry AX.BAT file for next use. Otherwise, the last AX.BAT file may surprise you the next time you enter AUTODEX.

FLst sends the entire directory to your default printer port. Filename, Size, Change Date and Description are included. This is a plain ASCII character dump (no graphics) that any regular 80-column printer can handle, as shown in Figure 3 (page 302). You can print out each disk and save the directories in a loose-leaf book for reference. While this is not as convenient as having one listing that combines ALL your disks, it's better than no lists at all.

When you select the Current command, you can change the default drive for the AUTODEX directory. This does not, however, change the DOS default drive, so you must keep a copy of COMMAND.COM in the DOS default drive to properly leave AUTODEX.

If you want to see the directory in AUTODEX format on another disk, use the Current command and just type the drive designation (usually A or B) when asked. The AUTODEX program is held in memory (until you Exit), and does not have to be on the disk you're reading! You can slip disk after disk in the default drive and keep using the Current command to read the directories in sorted order, and FLst to print them out.

The Backup designation allows you to specify the target drive to COPY a file. Normally, this would be B if your Current Drive is A—or visa versa.

The Date can be entered or changed. The default is the date of your system clock.

FILE AREA Commands

When your cursor is in the FILE AREA in front of a file name, you can invoke the file commands shown and briefly described in Figure 2. But be careful of the terminology! For some reason, AUTODEX uses the command B (Backup) when they mean COPY to another disk (the Backup drive noted in the DISK AREA section). Also, L (List) is used for a printout rather than a screen display.

C (Copy) is used to copy a file onto the same disk with another file name. E (Erase) deletes selected files.

The G (Goto) command lets you specify a file name or type, which then appears on the third file line, with all other files resorted accordingly. L (List) sends the selected file to the printer, if it is printable—such as an ASCII file—or you might get keyboard lockup. See the View command to check the file. Be sure the printer is on or all comes to a halt!

I suggest you avoid the M (Mark) command, intended to be used with the "Mult" command mentioned earlier. You simply type M in the CMD column in front of files you want included for the backup, list or erase functions of the Mult command. Unless you can be sure your system handles multiple file functions without crashing, don't use it.

The N (Next) or P (Previous) keys scroll file names the same as the PgDn and PgUp keys. R (Rename) lets you rename a file. T (Top) puts the highlighted file at the top row.

A particularly powerful command is the V (View) command. This actually displays the contents of most files—but not BASIC files. ASCII files (text and data) are shown normally, and are printable with the List command. EXE or COM files are shown in hexadecimal format, but the 16 characters on the right side are in ASCII. If you scroll through the file with the PgUp/PgDn keys you may spot some plain language. Figure 4 shows a partial View of a CLOCK.EXE file.

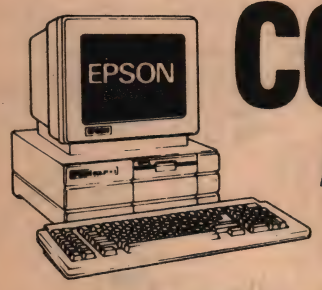
continued on page 306

```
                    * A U T O D E X (1.0) *
  * DISK AREA *   | Sort   Mult  | Current: A     Backup: B      Date: 012987
Disk Left:  15K   | Exit   FLst  |                                 Id: BOOT
File:  10 of  38  |              | >> Viewing A:CLOCK.EXE
  * FILE AREA *
Offset  0  1  2  3  4  5  6  7  8  9  A  B  C  D  E  F   0123456789ABCDEF
------  -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --  ----------------
0360   20 24 43 75 72 72 65 6E 74 20 74 69 6D 65 20 69   * $Current time i*
0370   73 20 24 45 6E 74 65 72 20 6E 65 77 20 74 69 6D   *s $Enter new tim*
0380   65 20 3A 20 24 43 75 72 72 65 6E 74 20 64 61 74   *e : $Current dat*
0390   65 20 69 73 20 53 75 6E 20 24 45 6E 74 65 72 20   *e is Sun $Enter *
03A0   6E 65 77 20 64 61 74 65 20 3A 20 24 30 30 3A 30   *new date : $00:0*
03B0   30 3A 30 30 2E 30 30 24 30 31 2D 30 31 2D 38 34   *0:00.00$01-01-84*
03C0   24 49 6E 76 61 6C 69 64 20 74 69 6D 65 20 24 49   *$Invalid time $I*
03D0   6E 76 61 6C 69 64 20 64 61 74 65 20 24 49 6E 76   *nvalid date $Inv*
03E0   61 6C 69 64 20 73 77 69 74 63 68 65 73 3B 20 69   *alid switches; i*
03F0   66 20 79 6F 75 20 6E 65 65 64 20 68 65 6C 70 20   *f you need help *
0400   74 79 70 65 20 43 4C 4F 43 4B 2F 3F 24 4E 6F 20   *type CLOCK/?$No *
0410   63 6C 6F 63 6B 20 66 6F 75 6E 64 20 24 43 4C 4F   *clock found $CLO*
0420   43 4B 20 48 65 6C 70 20 4D 65 6E 75 20 3A 0D 0A   *CK Help Menu :..*
0430   0A 43 4C 4F 43 4B 20 20 20 20 20 20 20 20 20 52   *.CLOCK          R*
0440   65 61 64 20 63 75 72 72 65 6E 74 20 74 69 6D 65   *ead current time*
0450   20 26 20 64 61 74 65 2E 0D 0A 0A 43 4C 4F 43 4B   * & date....CLOCK*
0460   2F 49 20 20 20 20 20 20 20 49 6E 69 74 69 61 6C   */I       Initial*
0470   20 73 65 74 74 69 6E 67 20 63 75 72 72 65 6E 74   * setting current*

                    © FRED BLECHMAN 1987
```

Fig. 4—Viewing CLOCK.EXE file.

YOUR COMPUTER CONNECTION!



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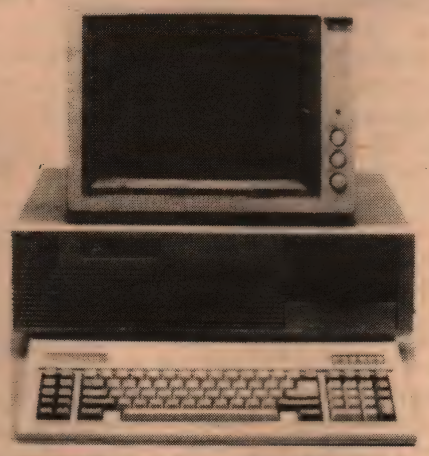

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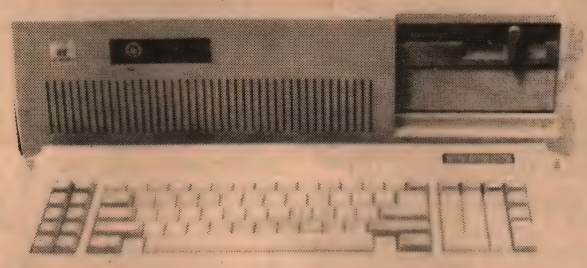

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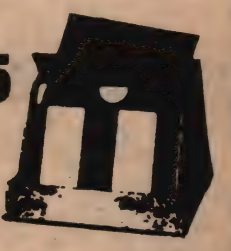

AUTODEX
continued from page 304

You can View most files before writing a description, in case you don't recall what the file is or does.

The Executioner

The last file command is X (Execute), which requires a little more explanation. When you type X in the CMD column in front of a file name, and press the ENTER key, you'll see a "Parameters:" prompt in the description column. This is optional, but handy.

Suppose, for example, that you wanted to run a BASIC program. You could use the G command and specify GWBASIC as the Name. This would move the highlighted bar to the GWBASIC file name (assuming, of course, that this file is on the disk in the current drive). Now press X and you'll see the "Parameters:" prompt. Just type the name of the BASIC program, press the ENTER key, and off you go! The computer will load GWBASIC and your specified program. Furthermore, when you exit BASIC with the SYSTEM command, you'll return to DOS and automatically go back into AUTODEX. Didn't I tell you this was neat?

If you want a program on another drive, use that designation as part of the parameter, such as B:PROGRAM. This can also be handy when you want to load in a word processor program and have it call a text file on another drive.

Problems?

I didn't write the AUTODEX program. The author seems to be anonymous, or lost in history. It is a powerful, well-behaved program, but occasionally does funny things, like locking up the keyboard, or refusing to respond to a cursor movement command. When all else fails, use the CTRL ALT DELETE keys together to reset to DOS. This is hardly catastrophic, and doesn't seem to mess up the disks at all.

Please don't call or write me with questions about AUTODEX. Read this article over carefully. All I know about AUTODEX is included—the rest (if there is any more) is up to you.

Sources

You may have trouble locating AUTODEX on a bulletin board or from a club library. Or perhaps you aren't equipped or inclined to download it from a bulletin board even if you do find it. Also, if you have a Sanyo 550 or 555, you need a special version. (It does not require the Sanyo Video Board.)

Two club librarians, who both helped me understand AUTODEX, are willing to provide readers with a disk with three files: AX.BAT, AXX.EXE and AUTODEX.DOC. The DOC file is this article, just in case you misplace the printed article.

The price, postpaid USA, is just $5. Tell them you want the AUTODEX disk described in *Computer Shopper*.

For the IBM PC/compatibles version, write David Nussbaum, President, Consolidated Computer Club, 11558 Riverside Drive #207, North Hollywood, CA 91602.

For the Sanyo 550/555 version, write David R. Earl, Librarian, Sanyo Users Group of Los Angeles, 1834 Butlar Apt. #7, Los Angeles, CA 90025. ●

Spotlight On Business
continued from page 156

perform this function running on every conceivable computer configuration from large mainframes to the smallest micro. A representative selection of this type of program is listed in Appendix A and many programs in this category have been reviewed in depth by LTAC.

Other programs in widespread use by attorneys include docket scheduling systems, conflict of interest monitoring, tax planning, bail bond support, litigation support, citation review and patent management control. Representative programs that perform these functions are also listed in Appendix I. A final category of programs not listed in Appendix I but often used by attorneys includes both general purpose products such as "1-2-3," "FrameWork," "Excel," "dBase III," "Paradox," "PFS" and "Rbase" that are used for "what-if" analysis or budgeting (in the case of the first 3) or maintenance of any type of file for any purpose (in the case of the last 4). Unlike the programs designed specifically for attorneys, these programs are sometime understood by computer retailers well enough to be explained, are the subject of many "how-to" books and have "how-to" courses taught about them in universities and adult education centers. A final group of products in this category are programs designed for special purposes other than pure legal applications but often used by attorneys. Programs in this group include portfolio management systems, property and rental management programs. Information about these programs may be found in the periodic *Ziff-Davis Buyers Guides* (there is one guide for MS-DOS systems and one for Apple products). Although these publications do not provide a critical analysis of the programs, they are comprehensive in their presentation and provide a good starting point to explore available products.

This article began with the statement that the legal profession has been a fertile ground for computer systems. Our analysis for the article confirms that statement but also makes it apparent that, particularly in the small firms, only the surface has been scratched. This situation should change rapidly both due to the efforts of the professional organizations such as the ABA and the fact that our law schools are now graduating computer literates in droves—attorneys who have been exposed to computers as word processors back to their undergraduate days and have used Lexis and Westlaw all through law school. Dean Philip Steinfeld of the Rutgers University Law School concurs with the feeling that the new generation of law school graduates will bring an enthusiam for computer use into all levels of legal practice. "The students use Lexis and Westlaw in the libraries, are exposed to word processing throughout their studies and are certainly free of the computerphobia that exists with many of earlier generations. The use of computers in the law schools will accelerate as Computer Assistance Education begins to make inroads into legal training. We will, for instance, begin this year to participate in an interactive training program in evidence developed by NYU that uses computers and video disks as integral parts of the instructional material. There will also be exposure for the students to the use of computers in law office management. I really feel that we are only at the beginning of technological penetration into every aspect of the legal profession."

Appendix I
Selected Legal Software

NOTE: * by telephone number indicates that the number is that of a service that disseminates information about the product for a fee. This firm has no connection with *Computer Shopper* or the authors and is listed as a source of information in cases where the telephone number of the product developer was not readily available. Additionally, the software listed here is intended to be representative of the universe of software that exists to support the legal profession. Inclusion of a product is not to be taken as an endorsement of such product.

Advanced Legal Software
(808) 526-9502; (800) 387-5062

Primary System
Cost: $1,995.00 (with all options)
Computers: Any with CP/M 86 (Digital Research) Operating System

A comprehensive law office management system which provides client billing, trust accounting and financial reporting for sole practitioners and small to medium-sized law offices (1 to 15 attorneys). The system maintains a full audit trail and contains provision for 182 hourly rates and an unlimited number of fixed hourly rates, retainer, flatfee and contingency billing. The system contains into 8 modules:

continued on page 308

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640K, PP, SP, RGB,
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2 fd $1249
20mb $1599
30mb $1699

PC-158 (4.77/8 Mhz)
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20mb $1979
30mb $2079

PC-200 (AT)
1.2 mb $2499
h/s 20mb $2999
h/s 40mb $3249

PC-181 Laptop (New)
2 3½" fd $1629

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9554 Old Keene Mill Rd.
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- SPECIALS -

STB EGA+ $249

TOTAL TURBO XT
640K, 4.77/8,
2 fd, Mon, FCC $875

VISA
Prices and availability subject to change without notice

SPERRY

SPERRY IT 44mb, 640K,
1.2mb fd, 2 SP, 1 PP clock,
keyboard, DOS, math
$2795

IBM XT fd, 20mb, kbd,
graphics, monitor
$2295

WYSE PC-286 6/10 Mhz
1.2mb fd, 640K, SP,
2/PP, c/c, DOS, kbd,
graphics, monitor
20mb $2399
40mb $2799

TOSHIBA 1100+ $1749

PRINTERS

ALPS	2000	$719
	2100	$1109
NEC	P5	$985
	P6	$459
	P7	$599
OKIDATA	192	$329
	192+	$375
	193+	$529
	292	$469
	293	$603
S/REED	420	$249
	600	$564
	800	$749
TOSHIBA	321 p/s	$469
	341 p/s	$649
	351 enh	$995
	351 color	$1129

Atari Releases Photos Of New Computers

At the Winter CES Show, Atari introduced two new computers the Atari PC and the Mega ST. *Computer Shopper* carried the stories in the March issue and mentioned the Mega ST on the cover. We were unable to obtain photos of the new computers to illustrate the articles. Atari now has released pictures of their new machines and we are able to print them for your information. ●

Atari's new Mega ST personal computer in the 4-megabyte configuration.

The Atari PC, the first IBM-PC compatible for less than $500.

DRI Introduces New Operating System For 80386-Based PCs

Digital Research Inc. has become the first systems software supplier to offer the marketplace a DOS-compatible, multitasking, multiuser operating system specifically designed to take full advantage of key features of the Intel 80386 microprocessor.

Concurrent DOS 386 provides a very high-performance, multitasking environment by eliminating the bottlenecks associated with multiuser processing. The operating system unlocks the high-speed 32-bit, 80386 processor, utilizing the large address space offered by the chip.

Concurrent DOS 386 is a significant enhancement from the multiuser, multitasking technology at the heart of the Concurrent DOS family, thus remaining compatible with the large, existing software base of Concurrent DOS, PC DOS, MSDOS, CP/M-86 and MP/M-86 applications. It also supports the Expanded Memory Specifications (EMS) without having to install special expanded memory boards, which typically impair the system's speed. Concurrent DOS 386 builds on the multiuser, multitasking technology which has been tested in the marketplace by Digital Research since 1979.

"Digital Research is extremely well positioned to take advantage of the new generation, 32-bit hardware that is being designed for the 80386 microprocessor," said Dick Williams, Chief Executive Officer of Digital Research. "In anticipation of this opportunity, we moved our Concurrent DOS technology forward to enter the market aggressively today with a powerful, feature-rich product, rather than promise it for sometime in the future," commented Williams.

Digital Research shipped the beta version of Concurrent DOS 386 to OEMs in January. ●

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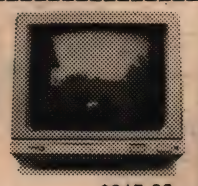

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RS-232 CARD	$ 34.00
640K RAM CARD "0" K	$ 42.00
AT 2M MULTIFUNTION OK	$132.00
XT 384K MULTIFUNTION OK	$ 85.00
XT MULTI I/O CARD	$ 73.00

MOTHERBOARD

XT TURBO 4.77/8MHZ OK	$ 99.00
XT TURBO 4.77/10MHZ OK	$109.00
AT TURBO 6/10 MHZ OK	$485.00
AT BABY AT 6/8 MHZ OK	$450.00

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MONOGRAPHIC PRINTER	$63.00
COLOR GRAPHIC PRINTER	$ 63.00
PARALLEL PRINTER	$ 16.00
AT E.A.G. & PRINT	$210.00

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BTC 5339 XT/AT/RT	$ 79.00
K-8 XT/AT	$ 55.00

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Spotlight on Business continued from page 306

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Aid Data Systems Inc.
(301) 987-6822

Bos Law Firm Management
Cost: $995.00
Computers: IBM PC & Compatibles running under MS-DOS, Burroughs B 20 running under BTOS, DEC Rainbow 100, Monroe System 2000, Tandy 2000, TRS-80 Models 12, 16 & II, TI Professional, Victor 9000, Zenith Z100

This system includes timekeeping, billing client maintenance, complete aging and management reporting and provides processing for five different bill formats, billing based on hourly rates fixed fees and/or contingent fees, states services rendered separate from expenses with the option to include lengthy descriptions for each transaction on the bill. Management reports show aging for each client account as well as how much each attorney produces, spends, collects, etc. for each billing cycle. The program can also maintain a docket/calendar and perform in-office searches. It can interact with BOS accounting programs for a totally integrated system.

Alpine DataSystems Inc.
(503) 243-1936; (800) 547-1837

Legal Management System—Multi-User
Cost: $3,250.00 - 10,000.00

Computers: DEC PDP 11, MICRO PDP 11, VAX SERIES, RSTS E & RT-11) IBM PC AT running under Microsoft XENIX
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(818) 888-3336

Bail Bonds__Manager
Cost: $695.00

Computers: IBM PC & Compatibles

Stores and retrieves case information by category (active, inactive, exonerated and inventoried), defendent profiles and accounts receivable for bail bonds agent.

Applied Software Technology
(408) 370-2662

Legal Office Manager
Cost: $499.00

Computers: Apple II, III, IBM PC & Compatibles

This system, based in Applied Software Technology's "VERSAFORM" file management system, performs the record keeping billing, scheduling and database management functions of a small to medium sized law practice. It also includes a system for performing a month-end close and bringing the balance forward.

Aptech Computer Services Inc.
(303) 483-5000*

Legal Time Management
Computers: Wang 2200 LVP, MVP, SVP, VP & VS

The Legal Time Management System provides for the billing and management analysis of time expended based on a wide range of criteria (such as areas of law, type of disbursement, types of activity or specialization, attorney rate codes, client type records, and billing memo codes).

Bear Computers Inc.
(309) 663-9412; (800) 327-BEAR

Attorney's Time And Billing System
Cost: $1,495.00
Computers: Various running under CP/M 80 (2.2) & CP/M Plus; IBM PC & Compatible running under MS DOS

This system provides a wide range of features for analysis and accounting of legal time expended. Features of interest to potential users include: Automatic application of retainer when appropriate, Availability of 999 user-defined billing codes, Ability to apply up to three (3) hourly billing rates for each attorney, billing frequency and degree of statement detail may be selected for each case, accounting for contingency cases, maintenance of balances for deferred billing.

Attorney's Docket Control System
Cost: $595.00

Computers: Various running under CP/M 80 (2.2) & CP/M Plus; IBM PC & Compatible running under MS DOS

This product records appointments, court appearances, filing dates, and other important dates and times. The system tracks up to 99 cases per client and maintains the following information for each case—attorney, docket date, appointment start time, appointment length, docket type, client file number, case file number, warning dates (2), opposing client's name, opposing client's address, opposing attorney, hearing judge, location of appointment and appointment comments. It produces daily docket reports by attorney as well as a wide range of other scheduling and analysis reports (including appointments by date, cases by judge, cases involving opposing attorney, appointments by client, appointments by category and appointments by docket).

Attorney's Conflict Of Interest System
Cost: $499.00
Computers: Various running under CP/M 80 (2.2) & CP/M Plus; IBM PC & Compatible running under MS DOS

This product is designed to aid in the decision-making process an attorney must go through before accepting a case by identifying conflicts of an ethical, legal or economic nature. It tracks active and closed client files, clients on retainer, and persons viewed as vital to the law firm and, when an item of possible conflict is found, provides fees earned, date of last activity, and type of case. In the tracking, it allows for reversed names, initials, abbreviations, hyphenations, and possible misspellings. Reports furnished by the system report, conflict master file listing, relationship master file listing, attorney master file listing, category master file listing, conflict transaction edit list, conflict master file by relationship code, conflict master file by last activity date and conflict master file by attorney.

Bicarsa Plus
(303) 483-5000*

Lawyers
IBM System 23

This Law Practice Management system includes General Ledger for the firm, Estate accounting, Accounts payable and Payroll as well as the maintenance of all client case work.

Billings Westlaw Pack
Billings Computer Corp.
(303) 483-5000*
Other Vendors: West Publishing Co.
Computers: Billings 500, 6000, BC-12
BOS (Archives)
BOS (Honeywell)

This package enables Billings users to access the West Publishing Co. law research service (to actually use the service, arrangements must be made with an authorized Westlaw representative). Price with installation is $595.00.

Blue Chip Software
(818) 346-0730

Law Office Management System (LOMS)
VER-2.0 & 2.03A
Cost: $2,100.00
Computers: Various running under CP/M 80 (2.2), CP/M 86 & MS DOS

The Law Office Management System is aimed at small to medium sized law firm and includes: Time and Billing, Client Disbursements, Trust Accounting, General Ledger, Aged Accounts Receivable, Aged Work in Progress, Client History Ledgers, Management Reports, Accounting and Audit Reports, Docket Items, Calendar Items, Client Statements, Reminder Notices and Interface to Word Processing.

continued on page 309

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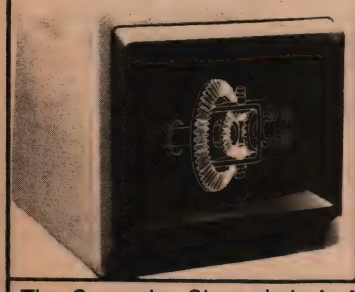

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F & W COMMUNICATIONS 194 Main St., Box 655, Marlborough MA 01752 (617) 485-1144

Spotlight on Business continued from page 308

California Continuing
(303) 483-5000*

CorpSystem
Computers: Apple IIE, IBM PC & Compatibles

This system aids in the preparation of corporate and other forms by an attorney. It provides forms diskette in many word processing formats such as Wordstar. Complete documents can be created directly from the forms in the System or those forms can be customized to conform to an attorney's particular usage. Looseleaf in a ring binder is $100.00 manual only, $400.00 for dedicated word processors.

Chelsea Systems Inc.
(303) 483-5000*

ALFA (Automated Law Firm Accounting)
Computer: TRS-80 16 running under TRSDOS 2.0A

This is an integrated G/L, A/P package with management reporting for law firms. Also integrated with billing package (LTM). This package includes: trust/escrow, financial management general ledger and accounts payable. ALFA has extensive reporting capabilities and includes a report generator. ALFA may be integrated with Legal Time and Billing or may stand alone. User references are available.

Compu-Law Inc.
(213) 558-3360

Legal Ledger
Computers: IBM PC & Compatibles

This product is a complete general ledger bookkeeping system, designed specifically for law offices. The program includes a user-definable chart of accounts, Cash Disbursements Journal, Client Disbursements Journal. Cash Receipts Journal and General Journal.

Client Management System
Cost: $995.00 - 1,195.00
Computers: IBM PC & Compatibles with fixed disk

This system performs time and retainer accounting and client billing. It also provides management reporting and account receivable processing.

Remote Entry/More Reports
Computers: IBM PC & Compatibles

This product is an "add-on" to the Client Management System and provides for rapid "batch style" entry of time, payments and cost advanced entries input from any compatible computer (with at least 1 floppy disk drive and 256K of memory) in the law office. (This information is later merged with the Client Management System data resident on the main fixed disk computer.) Available in the Client Management System. It also produces ten new productivity and financial reports (all previously requested by existing Client Management System customers.)

Computer Software For Professionals, Inc.
(415) 444-5316

LegalMaster
Computers: IBM PC & Compatibles (version sold in modules - total $4,100)
IBM Displaywriter
IBM System 23

This system supports the firm time billing, accounts receivable, retainer processing, docketing, calendaring, trust accounting and management reporting functions of a law firm.

Cybernetics Resource Corp.
(516) 883-7676

PC CYLAW VER-4.0
Cost: $795.00 - 2,575.00
Computers: IBM PC & Compatibles running under MS DOS, XENIX & CP/M 86; DEC Rainbow; other computers running under CP/M & CP/M 80 including: Altos ACS 586 & ACS 8600 Series; Bytec-Comterm Hyperion; Molecular Computer Supermicro Series

A Law Firm Management System: Time and Disbursement Accounting, Calendar/Docket Control, Invoice Printing and Custom Reports. A unique feature of the system is that there are no software limits on the number of clients, matters or text per entry maintained in the system. The Database Inquiry Custom report generator permits user to create unlimited custom reports and saves up to 100 custom reports.

Data Law Co
(303) 790-8193

Litigation Support Ver-1.02
Cost: $1,495.00
Computers: IBM PC & Compatibles running under MS DOS

Legal database management software that allows the user to select which information and characteristics to save (catalog important documents, store points of law and opinions, record expert witness testimony, dates, authors, subjects, nature of cases, expert testimony, etc.) and how it is to be presented (evidence by case, all expert witnesses on specific subjects regardless of case, all contracts by subjects, etc.).

Dickens Data Systems Inc.
(303) 483-5000*

A L O T
Computers: Various running under UNIX, CP/M & MP/M 1.1

This product is a law office management system.

EZ Ware Corporation
(215) 667-4064

EZTAX-PLAN
Computers: IBM PC & Compatibles; HP 1000 A; DEC Rainbow 100, 100+ & 100B; Tandy 2000; TRS-80 4 & 4P; TI Professional; Zenith Z100
Special Configuration: Lotus 1-2-3, Multiplan, or Excel. TRS-80 models with Multiplan version 1.07

Automatically computes comprehensive tax plans and produces filing forms for individuals and projects up to 10 years. Requires Lotus, Multiplan or Excel.

EZTAX-PLAN PRO
Computers: IBM PC & Compatibles; HP 1000 A; DEC Rainbow 100, 100+ & 100B; Tandy 2000; TI Professional; Zenith Z100
Special Configuration: Lotus 1-2-3, Multiplan or Excel.

Enhanced version of EZTAX Plan that performs personal and corporate tax planning. The system automatically: computes tax according to tables or schedules XYZ; schedule G tax (income averaging); alternative minimum tax; self-employment tax; credit for elderly or disabled; deduction for married couple; indicates marginal tax rate (tax bracket) for each year; project a sequence of future years; alternative strategies for a single year (up to 45); computes corporate income, alternative and minimum taxes; automatic carryover of unused credits, capital loss, and net operating loss; depreciation.

Financial Software Inc.
(303) 483-5000*

Conflict of Interest
Computers: IBM PC & Compatibles; IBM System 34; IBM System 36; Language: RPG II (IBM)

The system allows the entry of a firms existing case load is into the computer with relevant entities accompanying each case or matter. 1,296 user defined categories are available for establishing the relationship of an entity to case and a comment line is available for further description. The entry of a potential client's name into the computer will immediately refer the inquirer to any case or cases in which the person has been entered as an entity. Beginning and closing dates can be assigned to each case and entity as well as a date on which the information may be purged from the system.

Groundstar Software Inc.
(303) 483-5000*

Law Office Management Ver-1.0
Computer: OASIS (PHASE ONE)

Maintains current, accessible billings, receivables, matters, activity and attorney time. The law office management system supports the management of staff time,

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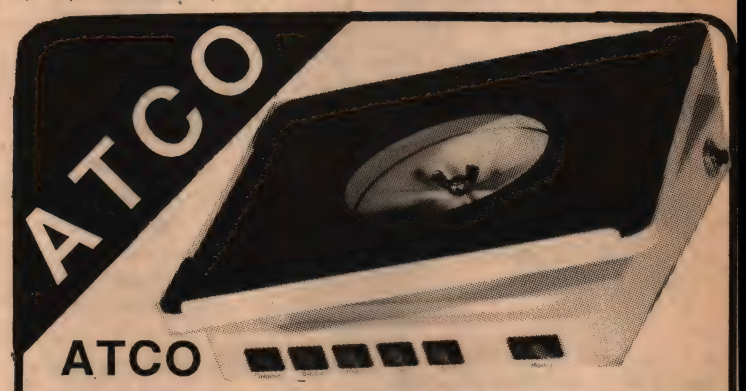

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Spotlight on Business
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creates client billings promptly and accurately, identifies areas of high and low profitability and reduces administrative costs and inefficiencies. The system monitors attorney and paralegal time, cost advances and client payments and automatically assembles this information into bill and management reports.

INC
(303) 483-5000*

PRS Legal Billing System
Computers: IBM PC & Compatibles running under MS-DOS and CP/M 86; IBM DisplayWriter

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International Micro Systems
(604) 683-7636; (800) 663-0545

Law Office Management
Cost: $2,200.00
Computers: IBM PC & Compatibles; DECMATE II; DEC Rainbow 100; computers running under CP/M

Jurisoft Inc.
(800) 262-5656

CiteRite
Cost: $395.00
Computers: IBM PC & Compatibles

Verifies citations for format, completeness and abbreviations. Based on the rules in the Harvard Law Review's famous Bluebook and winner of the Harvard Law Review's Certificate of Assurance, the system is compatible with Word Perfect, WordStar, WordStar 2000, Multimate, Microsoft Word and XyWRITE and can be used either as a memory resident popup program that works concurrently with word processors or as a stand-alone program.

CompareRite
Cost: $99.00
Computers: IBM PC & Compatibles

Compares two documents and produces a report of differences between the two.

Larimore & Associates
(303) 483-5000*

Law Enforcement
Computers: Wang 2200 LVP, MVP, SVP, T, VP, Professional & VS

Designed to eliminate the manual records processing that is done in the police records section. This system automatically updates the Uniform Crime File, allows immediate retrieval on all information entered, and updates a case number control file to indicate that the case number is used and to allow retrieval of all information segments by case number. The Police Entry Module is designed to process four information segments. They are, Incident Information, Name Information, Property Information. A case record can have one incident segment and any number of name, property, and vehicle segments. A property entry can be categorized as lost, evidence, damaged, etc.

Legal Data Services Inc.
(617) 426-1040 *

Executor Legal Accounting System Ver-2.1
Cost: $1,695.00
Computers: IBM PC & Compatibles; Televideo TPC-II, TS1605, TS1605 H, Systems running under MS-DOS, CP/M or UNIX with the availability to run RM COBOL

A totally integrated legal accounting system consisting of Time and Billing, General Ledger/Cash Disbursements and Docket Control.

Legal Information Systems Inc.
(303) 483-5000*

Law Office Management System
Computers: Alpha Micro 100, AM-1000, AM-1042 E, AM-1072, AM-1082, AM-1092, AM1000 & AMOS

LOMAS includes time and charges, calendaring and forms generation for legal offices. LOMAS is an integrated management system for law offices. It provides the user with an accounts receivable component, a tickler component for calendaring of cases, and a forms component for instant generation of legal forms. It enables each office to control and record entry of data on a lawyer to lawyer basis. Each component offers all of the necessary management tools required by the law office, such as separate trust accounting, recording of cash receipts, conflict listings, and the ability to locate data by client name or file number.

Manac
(303) 483-5000*

Manac Systems
Computers: IBM System 23/96K; IBM System 32/32K; IBM System 34/96K

Legal information management & retrieval systems. Manac provides a series of proven comprehensive systems that allow the lawyer to devote more time to the main task—practicing law. Financial management systems, Administration support systems, Integrated office systems, Legal practice management.

Master Data Center Inc.
(313) 352-5810

Master Legal System/PC
Cost: $2,000.00 - 6,000.00
Computers: IBM PC & Compatibles

An Interactive, Modular On-line Legal System. It utilizes a common database for patents, trademarks and general legal matters. Patent System, patent record management system for U.S., EPC and foreign patents from disclosure to expiration. Includes validation of critical data for accuracy and compliance with the laws of all countries. Trademark system permits management of worldwide trademarks and related information, including conflicts, oppositions, licenses and agreements. Country law validation is also a part of this system.

Mentor Systems Inc.
(303) 483-5000*

Law Office Mgmt. & Accounting Sys.
Computers: IBM System 23

Time & expense billing, accounts receivable for small firms. Performs time & disbursements management, client billing & collecting, administrative reporting, practice analysis, docket control & tickler system. Handles all record keeping & data organizing necessary to produce complete & accurate bills. Account balances automatically aged. Administrative reports of billable time for each attorney, cases in each court, profitability of both individual client cases and specific case types.

Micro Craft Inc.
(205) 830-9746; (800) 225-3147

Verdict Ver-3.2F
Cost: $995.00
Computers: Various running under CP/M 80 & CP/M 86, MS DOS

Produces itemized bills and monthly financial and timekeeping summaries for the small law firm of 1-25 lawyers. The itemized bills are ready to mail with a choice of four bill formats. Verdict includes seven different categories of bills: straight time bills, discounted bills, flat fee bills, monthly retainer bills, contingent fee bills, no-charge "bills" and "administrative time" bills. It also provides office management summaries. The manual is written for the novice computer operator.

Litigator Ver-1.0
Cost: $1,295.00
Computers: Various running under CP/M 80 & CP/M 86, MS DOS

A litigation support and trail practice management program. Litigator helps the attorney organize a case for trial. Information covering every aspect of a case is collected, so that case reports, special sorted and searched reports can be printed. Additional reports include Active Case Reports, Permanent and Active Client Lists and Conflict of Interest Searches, which help the law firm manage its trial practice.

Micro Information Systems Inc.
(303) 483-5000*

ESQ-1
Computers: Various running under CP/M 80 & CP/M 86

A professional time and billing system.

Scheduler
Computers: Various running under CP/M 80 & CP/M 86

This program is a docket/calendar control scheduling system for law offices.

Placida Systems Inc.
(813) 753-6297

Law Office Organizer Ver-1.0.2
Cost: $145.00
Computers: Various running under CP/M 80 & CP/M 86, MS DOS

Law Office Organizer is a low cost file manager for the law office.

Professional Software Sys. Inc.
(212) 819-0544

Legal Time Management System
Computers: Wang 2200 LVP, MVP, SVP, VP & VS

LTMS II provides time keeping and data entry, billing memos, bills, work in progress, accounts receivable and

continued on page 312

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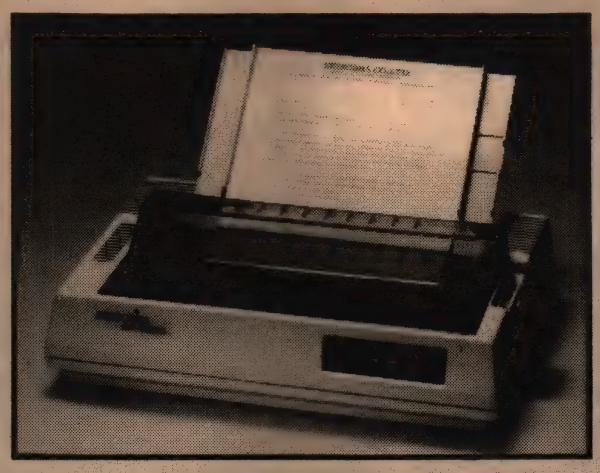

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• SP-1000AP, Apple® IIC/Macintosh™ compatible	199

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		Elite	*12x9	96	12	50
		Condensed	*14x9	137	17	70
	Near Letter Quality	Pica	*24x18	80	10	20
		Elite	*12x18	96	12	24
Italic Cursive Character	Standard	Pica	*16x9	80	10	100
		Elite	*16x9	96	12	50
		Condensed	*18x9	137	17	70
	Near Letter Quality	Pica	*32x18	80	10	20
		Elite	*32x18	96	12	24
Graphic	Single Density Graphic		nx8	480 dot column	—	600 dot column
	Double Density Graphic		nx8	960 dot column	—	490 dot column
	Double Speed, Double Density Graphic		nx8	*960 dot column	—	600 dot column
	Quadruple Density Graphic		nx8	*1920 dot column	—	*980 dot column
	640 Dot Graphic		nx8	640 dot column	—	326 dot column
	576 Dot Graphic		nx8	576 dot column	—	294 dot column
	720 Dot Graphic		nx8	720 dot column	—	367 dot column

*Indicates that the specified figure includes half dots.

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LANS vs Multi-user
continued from page 5

each other. The basic need for inter-computer communications is because all business is an interactive activity. We have given our personal computers all the resources they formerly had to share, but they still must be used in an interactive multi-user mode. The answer to this requirement is the Local Area Network (LAN) which was originally based upon established network technology. The most common way for two computers to talk to each other is via a serial port operating in RS232C mode. They use half duplex communications where one is the talker and the other the listener at any one time. A minimum of three wires may be used for the connection, with suitable software at both ends. The problem with this simple RS232 serial communications is speed since it can only operate at speeds up to 19,200 baud. We could however live with this speed restriction if there were no other problems. One problem with serial communications is the restriction on cable length in an unamplified system. Cable runs up to 50-feet work OK but beyond that signal loses cause problems in transmitting digital data, even when insulated cable is used. When there are more than two computers connected a form of switching must be used so that only one pair is connected at the same time. These switching arrangements can be anything from a manual switch box to a complicated microprocessor controlled interface unit. Simple networks using manually switched RS232 lines are used in classroom networks such as those sold by Radio Shack. More complicated switching networks are available and are effective for operation over short distances, as long as there are few computers and no requirement for high speed. For many users these will be satisfactory.

Once you get beyond the serial switching type of local network, you get into the real LANs. These have certain common characteristics no matter how they operate. First they have many local stations called "nodes," any of which can be a computer or a peripheral. Any of the nodes can support either a listener or a talker, or a listener/talker combination. They use some kind of a controller to operate the network with one master and a slave for each node. Finally they all use a combination of hardware and software to operate. Outside of these few common points all the various systems are different.

Networks are connected in various schemes called topologies. These come in several configurations. First is the Bus, which consists of a parallel connection of wires with the nodes connected across the Bus. Additional nodes may be added to the Bus by simply extending the Bus wiring and giving the new node its proper address. Another common topology is the Ring where the nodes are connected to each other in circular fashion. The Star is one of the most common arrangements where each node is connected direct to a common center controller node. The tree is another topology which connects groups of nodes on a Bus arrangement to a common Star controller then into another group of nodes on another level. The switching type of networks previously discussed for simple applications have come back into use for more complicated networks through the developement of the electronic switching PBX used for telephone communications. With so many of these being installed into offices they can be made to perform double duty both as a telephone switcher and a computer network.

The rate of transmission varies from system to system but is generaly grouped into two classifications baseband networks or broadband networks. Baseband refers to low frequency transmission at RS232C rates over wire pairs such as telephone wiring. This is very popular because it often uses common telephone connectors and jacks to connect network nodes. Broadband networks operate at rates much higher than baseband such as the megahertz rates of the computer internal Bus. Where large amounts of data must be moved, these networks can keep up with the processing rates of the computers on the network. The controllers for this type of network are more complicated and precise timing is required for operation. Transmission of broadband networks must be over coaxial cable or fiber optic lines. Where baseband networks can operate in the asynchronous serial mode, broadband networks usually use synchronous communications.

In networks, there are devices that are designated as talkers or listeners, or both. A printer may be only a listener, receiving data and printing what is received. However even printers are often both talkers and listeners because they report their status back to the data source. With so many talkers on the line at the same time there is a problem with the likelihood that two devices will be talking at the same time and data will be lost to both of them. The name of this problem is Bus Contention and its

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Spotlight on Business
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Professional Computer Services
(203) 255-3322

Office Accounts Payable
Computers: Various running under CP/M 80 (2.2)

Integrates with other ALS Accounting modules to provide the law office with up-to-date financial reporting controls. Office Accounts Payable fully integrates with the ALS general ledger to provide the law office with financial controls for all expenses unrelated to client accounts. The system is based upon entry of purchase orders at the time the expense is incurred in order to provide up-to-date information on law office expenses. Reports produced include purchase order forms, office accounts vendor list, office accounts payable, aging report and office open accounts payable report.

General Ledger
Computers: Various running under CP/M 80 (2.2)

Provides a law office an interactive, double-entry accounting system. General Ledger, together with the ALS management information. Information is available on both billed and unbilled time, staff utilization and profitability of practice. The system is designed to allow the firm to evolve in the use of this information as required. Contains Docket, Payroll, Adverse Party, Accounts Payable, and Litigation Support.

Core, provide the two keystones to the ALS law office accounting system. With the other ALS Accounting modules, the system furnishes the reporting controls essential to the financial management of a law office. General ledger is an interactive, double-entry accounting system which was designed in conformity with an American Bar Association's model accounting system for small, medium and large law offices.

Fixed Assets/Depreciation
Computers: Various running under CP/M 80 (2.2)

Provides for the creation & maintenance of a law office fixed asset inventory & for the computation & reporting of depreciation. Fixed Assets And Depreciation allows a law office to maintain information on all fixed assets such as description of the item, its location, acquisition cost, the depreciable basis and the like. The system computes and reports depreciation on each fixed asset and the law office may compute depreciation a number of ways and then select one method for reporting purposes.

Docket Monitor
Computers: Various running under CP/M 80 (2.2)

Automated docket control system to track and monitor important law office deadlines. Use of the system requires the ALS Core. Docket Monitor provides for printing of docket

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Spotlight on Business continued from page 312

control reports on demand for each attorney or for entire law office. The system features printing on letter-size paper; complete editing; and, full integration with Attorney Calendar providing for docket control entries automatically appearing on attorney calendars clearly marked "deadline."

Consumable Inventory Control
Computers: Various running under CP/M 80 (2.2)

Designed to solve the problems often experienced by law offices related to the control of consumable office supplies. Consumable Inventory Control is not a retail business inventory system. The system integrates with the ALS general ledger and is based on a purchase order system to provide controls of on-hand and on-order supplies. Physical inventory reports allow in-office counts to be made and order recommendation reports furnish the basis for re-order.

Conflicts Alert
Computers: Various running under CP/M 80 (2.2)

Law office system to perpetually record all potential conflicts of interest & to provide timely and complete information when needed. Conflicts Alert provides a law office with a growing database relating to potential conflicts of interest including information regarding various parties involved in litigation, opposing counsel, owned or related businesses, names of partners, spouses and children and other sources of potential conflict.

Client Trust Accounts Payable
Computers: Various running under CP/M 80 (2.2)

This law office accounting module provides the financial reporting controls for all client-related expenses. Client Trust Accounts Payable fully integrates with both the ALS general ledger module and the ALS Core to provide the law office with financial controls for all client-related expenses. The reports produced includes client trust accounts vendor list, client trust accounts payable aging report and client trust accounts payable aging report.

Client Resource Directory
Computers: Various running under CP/M 80 (2.2)

Automatically updated, cross-reference name, address and telephone directory. Client Resource Directory provides for immediate access to the names, addresses and telephone numbers of a variety of persons associated with client cases as well as court clerks, public attorneys, court reporters and other persons or agencies contacted on a frequent basis. CRD permits attorneys and law office support staff to work on client cases without the necessity of having the individual client's file at the time of placing telephone calls or writing letters.

Attorney Calendar
Computers: Various running under CP/M 80 (2.2)

Automated appointment scheduling and daily calendar for law offices and individual attorneys within law offices. Use of the system requires the ALS Core. The software features no system limitation on number of attorneys or calendar entries; printing on letter-size paper; complete editing; printing of calendars on demand for each attorney or for entire law office; in addition to date and time, a self-written narrative description of the nature of the calendar entry may be entered; automatic re-scheduling of entries without re-entering information.

Advanced Legal Software Core
Computers: Various running under CP/M 80 (2.2)

Comprehensive law office information management, client billing, trust account and office administration system. ALS Core provides the nucleus of the ALS legal software system and itself furnishes a comprehensive law office information management, client billing, trust account and office administration system. The system permits tailoring to the unique type or style of law practice. There is no system limitation on number of attorneys, clients or transactions.

Sensible Software Inc.
(312) 258-5566

Black's Law Dictionary
Computers: Apple II+, IIc, IIe, IIgs & Compatibles running under DOS 3.3 or PRODOS

This disk consists of the entire word list of Black's Law Dictionary for use with either Sensible Speller or Apple Speller. All 20,000 words from Black's Law Dictionary have been combined with 15,000 of the most commonly used words from our official Random House Dictionary to provide a comprehensive legal dictionary on a single disk. This legal dictionary can be used by itself or it can be used in conjunction with other Random House Dictionary disks for more extensive checking. This product does not contain a program; the user must purchase either of the Sensible Speller program for Apple II series computers.

Somerset Software Inc.
(303) 483-5000*

Legal Time Management
Computers: Wang 2200 LVP, MVP, SVP & VP

Stukeley Computer Services
(303) 483-5000*

Solace Ver-2.1
Computers: Various running under UNIX, CP/M & XENIX

This Legal Time Accounting System is targeted for attorneys practicing in England and Scotland and contains multi-user enquiry facilities. It provides a wide range of management reports including a profit and loss and trial balance.

Thought Works
(303) 483-5000*

Automated Contract Writer
Computers: Various running under CP/M 80 (2.2) & MP/M 1.1

The automated contract writing software package automates the process of composing of contracts by manipulation data structures consisting of standard contract clauses and standard contract types (defined by the user) which can be arranged to compose a contract of any defined type. The contract then can be edited by the user, stored and printed to produce a contract for a particular purpose.

Univair International
(303) 483-5000*

Legal Time Accounting
Computers: Various running under CP/M

This system maintains client and case histories and provides monthly billing, appointment history, multi- department accounting, auto-posting to SL. and production analysis.

Vector Graphic Inc.
(303) 483-5000*

Firm Solution
Other Vendors: Information Solutions Inc
Computers: Vector Graphics SX-2000, SX-3000, SX-5000 VECTOR 5 running under CP/M 80 (2.2)

Designed by lawyers for lawyers, this program helps with time keeping and billing. The program features automated time entry and billing, employee productivity review and quick inquiry/response into the status of any case.

Venture Software
(303) 483-5000*

Legal Time And Billing

Computers: Various running under CP/M 80 (2.0)
IBM PC & Compatible running under MS DOS

This system contains, in addition to normal time & billing processing, Accounts Payable, Accounts Receivable, Payroll and General Ledger modules.

Xerox
(303) 483-5000*

Westlaw
Computer: Xerox 860

A software package for the 860. The Westlaw provides an interface into the Westlaw computer-assisted legal research system.

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A LAN Primer
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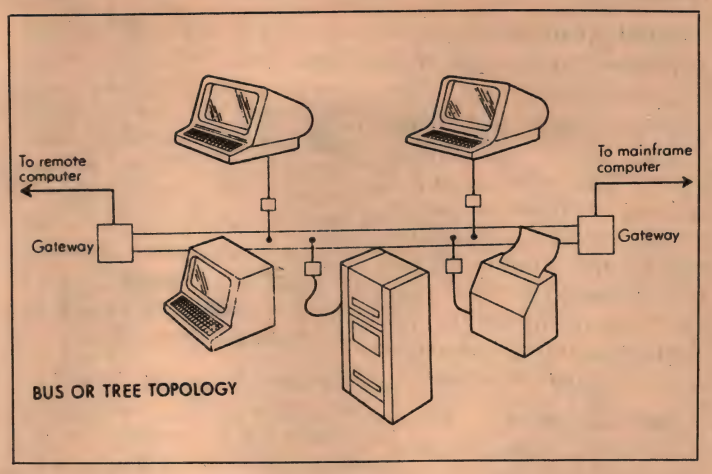
to change. In other words, the user need not know that a change has taken place. His/her reference to that printer remains the same. VINES is built as an application running under UNIX (it comes with the UNIX built in). VINES also provides security and record and file locking. VINES can run on a variety of network hardware.

TCP/IP (Transmission Control Protocol/Internet Protocol) software is operating system independent networking software. Unlike all the other networking software, TCP/IP is the only implementation of networking software that follows an official standard. TCP/IP is the official standard networking protocol of the Department of Defense. It has been implemented under a wide variety of operating systems. It allows file transfer (disk service) between similar and dissimilar machines and remote login with terminal emulation. It does not allow the reading of individual records from files (file service). TCP/IP software is available from a variety of vendors including Proteon, Ungerman-Bass, and Excelan.

There are quite a few other vendors that supply network operating systems. They include AT&T, Corvus Systems, Server Technology, The Software Link, Torus Systems, Digital Research, Microsoft, IBM, ViaNetix, and The Santa Cruz Operation. Each of these systems has its own merits and special features. However, one would need to write a book to cover them all.



After selection of a network operating system, one would probably want to decide what type of server he/she needs. The server is the machine that provides the services to the network. Obviously, the more machines requiring service, the more powerful a server is needed.

Novell, Banyan, 3Com, and AT&T are among the leading manufacturers of special purpose servers (machines built from the ground up to be servers). Smaller networks can use general purpose machines (such as IBM-XTs or IBM-ATs) as servers. The selection of servers should be made according to the recommendations of the network operating system vendor with respect to number of users and speed.

With the network operating system in mind, one should then choose compatible hardware. Here is an overview of several LAN hardware implementations:

AT&T's StarLAN is an easy-to-implement and flexible network. It runs at about 1 megabit-per-second over twisted wire pairs. StarLAN uses the same baseband CSMA/CD protocol as Ethernet. Physically, StarLAN can be configured as a BUS or Star topology.

Corvus' Omninet uses a baseband transmission method with the CSMA/CA protocol. The Omninet runs over twisted wire pairs at 1 megabit-per-second. Corvus is generally configured in a BUS architecture.

Gateway Communications' G/NET runs over coax cables at 1.5 megabits-per-second. The G/NET uses CSMA/CD protocol and baseband signaling. G/NET uses a BUS topology.

IBM's Token Ring network runs over twisted wire pairs at 4 megabits-per-second. The Token Ring is an implementation of the IEEE 802.5 protocol and is built in a Star topology.

Proteon's Pronet-10 runs over twisted pair using Proteon's proprietary token passing protocol. Pronet-10 runs at 10 megabits-per-second. Physically, Proteon-10 can be configured in almost any topology.

Standard Microsystems' ARCNET network is built on coax cables in a Star topology. It uses the IEEE 802.4 protocol with baseband signaling.

3Com Ethernet uses the standard CSMA/CD protocol (IEEE 802.3). The 3Com Ethernet uses baseband signaling and a Bus topology. Ethernet runs over coax cabling.

6. Ungermann-Bass' Ethernet is also classic CSMA/CD network using baseband signaling. It runs on coax cable in a Bus topology.

The list above is by no means complete. Here are a few vendors who may provide more information on networking solutions:

AST Research, 2121 Alton Avenue, Irvine, CA, 92714, 714-863-1333.

AT&T Information Systems, 1776 On-the-Green, Morristown, NJ 07960, (800) 247-1212.

Banyan Systems, 135 Flanders Road, Westboro, MA 01581, (617) 366-6681.

Bridge Communications, 1345 Shorebird Way, Mountain View, CA 94043, (415) 969-4400

Codenoll Technology, 1086 North Broadway, Yonkers, NY 10701, (914) 965-6300.

Corvus Systems, Inc., 2100 Corvus Drive, San Jose, CA 95124, (408) 559-7000.

Datapoint, 9725 Datapoint Drive, San Antonio, TX 78284, (512) 699-7000.

Excelan, 2180 Fortune Drive, San Jose, CA 95131, (408) 434-2300.

Gateway Communications, 2941 Alton Avenue, Irvine, CA 92714, (714) 553-1555. (IBM (contact local regional office.)

Intel, 3065 Bowers Avenue, Santa Clara, CA, (408) 987-8080.

Orchid Technology, 47790 Westinghouse Drive, Fremont, CA 94539, (415) 490-8586.

Proteon, Two Technology Drive, Westborough, MA 01581, (617) 898-2800.

Standard Microsystems, 35 Marcus Blvd., Hauppage, NY 11788, (516) 273-3100.

3Com, 1365 Shorebird Way, Mountain View, CA 94039, (415) 961-9602.

Ungermann-Bass, 2560 Mission College Blvd., Santa Clara, CA 95050, (408) 496-0111 ●

LANS vs Multi-user
continued from page 312

solution is one of the major design objectives of network designers.

In most of the Bus Contention solutions, each node on the network is given an address and when a talker has data to transmit to a node, it listens on the network until no other node is sending and then sends a message to the node address to find out if it is ready to receive data. The receiving node sends a message back if it is ready to receive and then at the next time available, the talker sends the data. This system requires smart controllers and precise timing, therefore the cost per node is quite high. In the effort to reduce costs, other schemes have been developed. One of these is the token passing system which is used in the IBM network. In this scheme there is also an address for each node and all of the nodes are talker/listeners. The token is a code which is passed from node to node. The only time a node can transmit is when it has possesion of the token thus eliminating the possibility of data loss through collision. Although the IBM system is impractical, they took so long to come out with it that many other systems were developed. These include systems from Novel, Corvus, Xerox and others. None of them is about to concede to a new entry in the field and the possibility of one system being accepted over all others is so remote that it should not be considered. The best that can be hoped for is the development of "gates" between systems and this is being done by all manufacturers in order to accommodate different computers on the same network and to provide access to other networks.

Being faced with the need to decide a course to adopt has made many people who really need a network refuse to adopt one. The solution of moving a disk from one computer to another seems better than the chance of making a serious mistake in choice of a system. It is the proliferation of many types of computers in an office with the need to share data among them that finally makes a company decide to install a LAN. Once the decision is made the agonizing selection must be made. This is no small matter because the wires must be run and the equipment located where it is going to be used. This is often difficult to change once the network is set in place.

Up to this time users with MSDOS systems were not able to make a choice between multi-user systems and the installation of a LAN and retaining their MSDOS system. If the answer was to go multi-user, the computers had to be one of the systems built for this purpose such as DEC, Tandy System 16, Altos, Alpha Micro, Gimix, Stride, CSI or other systems none of which ran MSDOS as their prime operating system. This is soon to be changed with new operating software capable of using the protected mode of the 80286 and 80386 for multi-user operation. When this choice is possible many users may decide to wait for the installation of a LAN and use a multi-user network instead. If this is their decision, they may be able to connect the entire multi-user network into the future LAN via a gateway and retain their investment. One data processing manager told me that his company has considered every possible solution and ends up moving disks from one PC to another every time. The demand for LANS and multi-user systems is stronger than the products, in the mind of many users. ●

Sinclair Survival
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clusion into the Music Album program. The third option is used once a composition is completely edited and is in its final form. This option SAVEs your work in a manner to be played as an independent piece. With this type of SAVE you can no longer edit or add to your work. You also have the option to change the tonality of a piece when you SAVE it in this manner.

The Music Album portion of Musician Royal is the finer of the two playback programs included. Its tempo fidelity is as good as can be achieved with the T/S 2068 without special corrections. The capacity of this feature is 8 compositions with about 2000 notes total. You can make as many Music Albums as you wish. Your control over tempo and tonality is finer in this program than in any other. In contrast to the Music Box you cannot automatically add new compositions to the Music Album. The Music Album plays music by READing data lists for each composition. These lists must be typed in by hand.

One of the nice things about this program is that you do not have to compose your own music, but can easily transcribe any form of sheet music available. Very complete instructions on how to accomplish this are included in the manual.

The strong point in this package has to be the excellent documentation that comes with this software. Within the pages of this manual are not only clear and precise instructions, but a number of pieces of music which you can immediately transcribe into your own Music Box and Music Albums. The manual covers over 75 pages and is spiral bound between rigid covers to make it very convenient to use.

If you want to play around with the musical capabilities of your T/S 2068 without learning the programming of the BEEP command, contact Electret Scientific Co. Post Office Box 4132; Star City, WV 26505; (304) 594-1639 for information on ordering Musician Royal. And don't forget to mention where you heard about it. ●

Sony and Multiscan
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is up front with an indicator light. Other controls are on the rear. A text switch is not provided.

The manual for the MJ 503 was fairly well written and provided essentially all needed information in a clear format. Examples of typical picture distortions and adjustments are included in a trouble-shooting chart.

A minor, but noticeable, defect was the failure of the adhesive that held the rubber feet to the bottom of the case. Two of the feet fell off on their own and the other two pulled away with scant effort.

This monitor has a list price of $849. At that price point, the minor problems with adhesive and CRT-quality control are less tolerable than they would be in a low-priced color display. The MJ 503's hard-wired power cord also lent to an overall sense of low quality and corner cutting for a relatively high-end display. The longer warrantee from Teknika, and maybe some heavy discounting, really seems necessary to reinstill confidence in this product.

Taxan Super Vision 770

Tests of the EGA image produced a clear, sharp image with good 16-color differentiation. Severe curvature in the CRT's face produced an obvious bow in straight lines on both sides of the display. This was the only monitor tested with such an extreme distortion in its image.

The 770 has adequate frequency ranges to provide Hercules graphics. Unfortunately, the absence of a text switch prevents the output from being displayed in anything other than a nearly invisible dark blue on black. It is practically impossible to use the unit in this mode.

Taxan's entry was the other monitor to require a screwdriver for certain adjustments. But it also had the greatest number of accessible controls up front. The contrast, brightness, horizontal and ver-

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The Saga
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her, held out to her the straggly bouquet.

She took it with a beep of delight, turning the planes of her lovely face toward him like a back-lighted LCD display. He could read her face as clearly as hard copy, and it said—with charming nonchalance—"I am very user-friendly, but beware, I am not user-transparent!"

He found the words falling from his mouth. "Hello. How are you, Honeywell?" "Yes, Manny, I am well!" she responded, batting her optical fibers in gentle swishes. "You know my password," he said, "and who are...?" "Come on, silly. I am Angeline, and we have met before...You told me to come when I needed help with my clone. Well, I need it tonight."

It all came back to him. But somehow he hadn't noticed what a beauty she was. He had talked to her a few days before in the computer shop, but perhaps was distracted by Concurrent DOS. Too much concurrency can be very distracting! Flattered by her attention, he was more concerned with his own image in the digitizer and didn't really encompass hers. But she had his attention now, and he felt himself swiftly sucked down into a kind of pleasureable bondage.

Manny pulled himself together and fell into familiar patter, settling for a straight line approximation. "Well, you came at a good time. I'm stand alone tonight. How about a byte to eat?" Affirmative. "Well, great! I'll dump this stuff in the house, wash my face and we'll compute a vector to a seafood restaurant. There we can discuss your clone..." "OK," she transmitted, "I'm ready to exchange data and a byte to eat will fill my warm boots."

They arrived on the scene and sat down at the process table, ordering fiche and chips, and a bucket of baudot. In the conversational mode that followed, he appeared to respond to her queries about applications software, while he was actually busy recalculating all his "what if" analyses.

She made it all so easy for him. Her glances were pop-up menus whose selections could be accessed directly by moving her highlight bar. The ease of learning her program was unrivaled by any previous encounter in his experience. He was emboldened to come right to the point: "Would you be interested in my benchmark subroutines?" She always, it seemed, sprinted one step ahead of him, as though Cruise Control were active with strategy D.

"Let's do a logical format at your place," she rejoined, rising from her chair and sweeping toward the door. Her very brusqueness had a touch of innocence and freshness that accelerated his step rate.

He said: "You are my PFS:First Choice, my Enable, my PeachTree, and my Flight Simulator III. You are my dBaseIII, my King's Quest."

She responded in kind: "You are my 123, my ABC, my Free Lance, my Pagemaker, and my Mind Quest! You are my ineffable Zork, Versions I, II, and III, of which there are no words to say more."

Both were breathing heavy when the Super-Debug arrived back at his offset, and, their peripherals entwined, they rushed together into the apartment, and into the micro room. What a wonderful blend of innocence and shamelessness there was in this creature Angeline! She was the fearless embodiment of the industry's youth, vigor, joy and bountiful appetite, in spite of recent depressed sales.

She stripped off her parity bits and flung them about the room, revealing the full openness of her architecture and the trim functionality of her operating system.

"Are you giving me an error message?" she asked incredulously in a curiously sympathetic way, as though she wanted to help. But NO, he knew the truth. She was the Belle Dame Sans Merci, tempting him with pity and compassion, to deepen his self-hate, to rub salt into his wounded CPU, and to undermine his self-esteem and his confidence. She was chilling his solder joints, freezing his math chip, locking his scroll, his caps, and his num; in fact, his very num had gone numb. "Core" was all he could say. "Core, Core!" It sounded like a turtle dove lost in a fog.

"What are you saying?" she pleaded, unsatisfied, disappointed, and now growing angry. "This whole encounter is an error? You can't help me with my clone. You need one yourself. I feel so sorry for you, the king of multi-user, multitasking, and you don't have the right stuff at all. I pity you, but I cannot love you."

There it was, the ultimate put-down, and Manny, the power user, the invincible moocher, was the patsy!

She grabbed her parity bits and drapped them hastily on her back, trailing escape codes behind as she fled through the door. Her last words lingered on the fetid air: "You are nothing but an Auto-CAD, you are KnoWare, my Hangman. You are the penultimate light pen whose light has gone out..I wish we had never met..."

For Manny, life has lost much of its edge! According to Dr. Dr. Zuckerman Zuckerman, it may be many months, maybe years, before the ego heals. The world of computing has lost one of its heroes. He now may never be admitted to the Garage of Fame! But then of course, he has the wrong first name anyway. Only Steves are voted into the Garage of Fame! And it hasn't been established yet.

The Good Good Dr. Dr. has prescribed Doubledos of Unix Unix twice a day. In addition, Manny has been ordered to ponder the great classical unsolved problem of cybernetics, namely the installation procedure of MicroSoft Windows. "I expect," said Dr. Dr. Z. Z. (Tops), "that we will know he is cured when he throws Windows out the window, which may be the only true solution to the age-old puzzle." When not so occupied, Manny the Moocher can be seen in the dim recesses of his hospital room, sitting in a darkened corner with his head bent down, his eyes scanning his knee-caps for...what? An Escape key? The stigmata of his martydom?

My friends. Do not stray among the micros, for they are all as sounding brass and empty buckets. Beware the sin of Hubris which afflicts the power user; the hypnotic roaring angles of Hex and love, for they will wipe the code from your Eproms and render your operating system an emasculated wanderer among the tantalizing pillars of salt. Do not fly too near the sun or you may end your days the prisoner of an arcade nightmare. Pity the plight of Manny and guard yourself against his sins. Oh the pity, the pity...

Editors Note

For the April issue of every year,
I end up crying in my beer
Selecting a story from all that come in
To make my readers stop and grin.
Realizing that they've been had by such drool
And made to play the April Fool.

Stan Veit

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Figure 1	Sony	Taxan	Teknika	Thomson
Scanning Frequency:				
Horizontal (KHz.)	15- 34	15-34	15-34	15.75-35
Vertical (Hz.)	50-100	50-90	55-63	45.00-75
Bandwidth (MHz.)	30	30	23	30
Dot Pitch (mm.)	.26	.31	.31	.31
Maximum Resolution	900x560	800x600	926x580	800x560
Signals Supported:				
Analog				
(PGC)	RGB	RGB	RGB	RGB
(NTSC, PAL)	-	-	-	Composite
Digital/TTL				
(3270)	RGB	-	-	-
(CGA)	RGBI	RGBI	RGBI	RGBI
(EGA)	RrGgBbI	RrGgBbI	RrGgBbI	RrGgBbI
Power Consumption (Watts)	96	100	132	90
Price	$975	$945	$849	$895

Sony and Multiscan
continued from page 315

tical position are all located on easy-to-reach wheels behind the left side of the monitor's bezel. Their relative locations must be memorized since they cannot be seen from the front. Accompanying them is a rocker switch for power.

There are separate nine-pin ports for analog and digital inputs which should preclude damage from incorrect switch settings so long as the cable is correctly installed. Indicator lights on the front show TTL or analog settings as well as power on.

The 770's manual is almost a non-document. That is not a comment on its word-processing format. There are only three pages. That skimpy sheet may not be enough for novice users.

Thomson Ultra Scan 4375M

Ultra Scan produces excellent differentaition of colors across its entire range of contrast and brightness adjustment. It does not have quite as much brightness as some of the other monitors but it is adequate for well beyond EGA resolutions. There is also a certain amount of jitter in the image that is annoying only when attention is focused on a detail of the picture. The flat screen produces fairly straight lines with just a hint of curvature at the sides. The screen of the Thomson also had a slight tilt similar to that of the Teknika although so much less pronounced that it went unnoticed for quite some time.

This monitor is capable of running Hercules graphics because it scans its entire horizontal and vertical ranges. A monochrome switch, on the rear of the unit, is provided for green display of monochrome output. Without this switch, monochrome input is displayed in the same eye-killing blue sported by the Taxan. The monochrome switch cannot be used to color the white on black output of the EGA standard. It can, however, change an EGA-color signal to green

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Cheapsquawk
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(Radio Shack part #40-248). Any small 4 or 8 Ohm speaker that can handle a couple of watts will do. Scrounging a dead solid-state junk TV set is a good strategy, as it will yield a decent speaker, a volume control pot, resistors, and numerous small electrolytic capacitors that will also come in handy. Parts can also be scrounged from various radios, electronic games and toy noisemakers, etc. but watch the voltage ratings and polarity of electrolytics. Capacitors for 12VDC service ought to be rated for at least 16 or 18 volts, and 24 volts gives a better margin of safety. Older, tube-type junk TVs should yield a good speaker and volume control, but fewer other usable parts.

I built my amplifier on a Radio Shack experimenter's perfboard, (#276-150, @79 cents) but any small perfboard or home-made board would do. I used direct-solder and jumper construction without sockets, but a socket for the IC would be handy if you want to wire-wrap up your circuit, or experiment with different surplus amplifier chips. My heat sink was homemade from a flat piece of 1/16" aluminum about 2 inches square, which is bolted to the back side of the 5406 by means of 8-32 machine screws in the holes provided in the IC package. Almost any flat piece of scrap aluminum will work, even from a dead lawn chair or screen door; remember to use a liberal coating of silicone thermal grease, such as Radio Shack #276-1372.

Figure out the layout of the IC and major parts on the board BEFORE you start soldering; make sure there will be physical room for the heat-sink when the chip and/or socket is soldered in, and that there will be clearance when the completed amplifier is mounted in the monitor cabinet. If your monitor has a removable back panel, this is a convenient place. Avoid the CRT yoke, socket, and the high voltage section when locating wires to your speaker, input jack, volume control, and the amplifier itself. Keep the input and volume control wires, which are high impedance, as short and direct as possible. Use shielded wire, and ground the shield carefully. I mounted my speaker over some ventilation slots in the monitor cabinet with dabs of silicone rubber RTV sealant. A homemade aluminum bracket and pop-rivets or self-tapping screws would work as well. If your monitor doesn't have surplus ventilation capacity, or the location of the existing slots is inconvenient, drill a cluster of small holes in the back panel and use that for a speaker grille.

BE CAREFUL when working around the neck of the CRT tube, and wear safety goggles! An imploding CRT tube is potentially very dangerous. Also, be careful not to get bits of metal and drill shavings into the monitor electronics. Clean carefully with a vacuum nozzle or compressed air if you can. A piece of masking tape, sticky-side down, on the other side of a panel will help control the drill shavings when you do drill. Again, BE CAREFUL! If you can mount everything on a removable back panel, and do all the messy work out on a workbench or tabletop away from the monitor's insides, so much the better!

As mentioned before, you can often scrounge the small electrolytic capacitors from junk TV and audio equipment. Most of the values aren't very critical; plus or minus 20% or more should work fine. Don't be afraid to experiment, and substitute parallel combinations of smaller capacitors. For example, instead of a 47 uF. capacitor, you can usually use a couple of 22 uF. ones in parallel, or maybe a 33 uF. and an 18 uF. Watch the polarity and voltage ratings, though. You can substitute a capacitor with a HIGHER voltage rating, such as a 50 volt one instead of an 18 volt one, but the higher voltage capacitors will be physically bigger, and take up more space in your layout. If you have to buy some of the capacitors, you can usually save money in the long run by getting an assortment from a mail order dealer or at a swap meet, rather than by buying the parts individually at a retail store.

As mentioned before, the input line from pin 5 and capacitor C1 to the volume control is high impedance. It should be kept short and be shielded to prevent picking up hum and video noise. Volume control R2 should be about 10K ohms, but almost any pot will do. An audio or logarithmic taper pot is ideal, but a linear taper will also work. The volume range will simply tend to be crowded into one part of the pot's tuning range. If the sound from the speaker is excessively loud and distorted, resistor R1 can be added. You can experiment with different values, starting with a couple of thousand ohms, or perhaps substitute a small screwdriver-adjust trimmer pot in the 10K or 12K range.

I disabled the daisy-chain video connectors on my monitor, and ran shielded wire from the volume control to the spare RCA jack for the input line. I used a separate shielded cable to the DIN plug on the Commodore C-64, to minimize pickup of video buzz. The capacitors on pins 6 and 7 are ripple filters for both of the amplifier channels; if your monitor's power supply is reasonably well-filtered, you may not need them; mine runs fine without them. If you leave them in and still have power hum, try a larger value for capacitor C2 on the 12 volt pin 1 DC supply.

If your power supply is quiet, but you have trouble with video noise on the input, try a different physical location for the connector, input line, and the amplifier itself. Be especially careful with soldering the shield on the DIN connector for older Commodore C-64s. The high-level video output is on pin 4, and the audio is on pin 5, very close together. ●

****

Table #1.

Parts List for simplified, single-channel BA 5406 Audio Amplifier (Fig.1)

R1: (optional) 2.2 K Ohm nominal (see text)

R2: Volume control--Typically 10K Ohm Audio Taper Potentiometer.

R3: 120 Ohm

R4: 2.2 Ohm

C1: 2.2 to 1.0 uF.

C2: 1,000 uF. (minimum)

C3: 33 uF.

C4: 47 uF.

C5: 470 uF.

C6: .22 uF to 1.0 uF.

C7: (optional) 47 uF. (see text)

C8: (optional) 100 uF. (see text)

Also needed: small speaker in the 2 Watt range, Perfboard, shielded wire, mounting hardware, scrap aluminum for heat sink, connectors, solder, etc.

****

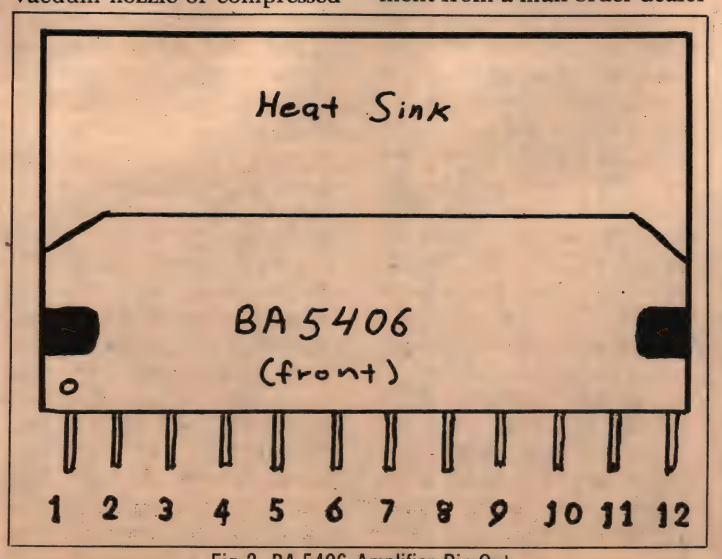

Fig 2. BA-5406 Amplifier Pin-Out

Sony and Multiscan continued from page 316

monochrome depending on the color palette.

The latter capability is unique to the Thomson. With the NEC, the text switch changes color screen to a single color—text and all. Now that's monochrome!

The power-on button, brightness, and contrast wheels are located at the front. All other controls are at the rear but normal operation is so automatic that their placement should not be a problem.

Three input connectors are featured including separate 9-pin TTL, 25-pin analog, and RCA composite inputs. This arrangement makes it virtually impossible to connect the unit incorrectly but it does require an unusual custom cable. It is possible to superimpose the video composite image upon the analog signal for a special effect.

Thomson's manual is the best in this group and may be the best that I have seen for a comparable piece of hardware. Not only well written and complete, it has graphics and layout that make it a pleasure to read. This is, perhaps, a consequence of the word **Consumer** in the company name (Thomson Consumer Products Corporation). It is certainly an indication of quality control that extends all the way to the consumer's use of the product. Dr. George Smith, marketing-professor nonpareil, would love it.

Sony Multiscan PDC-1302

Tests of the EGA image produced clarity and excellent 16-color differentiation. The .26mm dot pitch gives a picture that is visibly sharper than all the others. Colors were very intense although their best appearance was achieved close to the extreme limit of normal contrast and brightness adjustment. The CRT is so nearly perfectly flat that straight lines look like they're brittle enough to break if something tried to bend them.

Sony's super-fine dot pitch allows this monitor to display resolutions well beyond its 900 by 560 specification. Resolutions of at least 1024 by 600 noninterlaced are possible with boards like the Photon 800 Plus from Personal Computer Graphics Corporation (PGC) of Culver City, California. Resolutions of up to 1024 by 768 are possible in interlaced mode (thanks to the vertical scan limit of 100 Hz) but the image has a slight flicker due to the unit's relatively short-persistence phosphor. A test, at that resolution, with PGC's Photon 800 board, wound the Sony up to a 48MHz bandwidth—far beyond its published specification—with no problem.

The unit is also bright enough to give good visibility to the smaller **pels** produced at higher resolutions. (Pel is IBM's name for pixel—or picture element—just thought you might like to know.)

The Sony also displays Hercules graphics and supports the widest range of vertical frequencies. There is no switch for coloring monochrome text. Sony even does this automatically when it receives a monochrome input signal. The nuisance of reaching over and behind the long unit is eliminated.

The wheels for brightness and contrast are provided on the right side along with a rocker switch for the power. A power-indicator light is near the upper right corner. Other controls are on the rear but normal operation is essentially automatic.

Sony includes a switch that changes the pin assignments for its input. This switch allows the Multiscan to work with true RGB signals such as those of the IBM PC 3270 (CGA and EGA standards use RGBI and RrGgBbI signals).

While this unit has a single nine-pin connector for both analog and digital signals, the circuitry is protected from damage caused by incorrect switch settings. The analog/digital switch and the pin-assignment switch (collectively referred to as the RGB input selectors) can apparently be set to any combination without inducing havoc (at least while connected to TTL inputs). There are no warnings in the documentation.

Sony fails to mention its potential resolution extensions in its documentation. Aside from being so conservative in its claims, the manual is fairly complete and well written—bilingually—in English and French. It tends to be a little technical and that may pose a minor difficulty for some users.

Overall, this display has a slight edge on the competition because of its high resolution, extended frequency range, and super-fine dot pitch. Little details like the automatic monochrome-color change really add the **coup de grace**. Sony asks a stiff $975 for all of this, with a tilt and swivel stand and one cable, for either digital or analog signals, but for those who can't resist perfection, it's worth it. The monitor alone sells for $30 less.

Summary

These monitors all primarily address one of the most frustrating problems created by the endlessly accelerating development of new technology. Obsolescence. As with microcomputer technology in general, the power of more sophisticated graphics will eventually trickle down as the technology becomes more common and costs fall. Once the marketplace reaches a certain critical mass, however, software kicks in and the trickle becomes an avalanche. This is the current status of the EGA. Although two-years old, it has just become rampantly popular over the last several months. Growing popularity, and the accompanying flood of low-cost alternatives, have fed each other to create an ever increasing market.

With each change of display adapter that we have been seduced into accepting, even demanding, there has been the added cost of a new display. Multisync, or Multiscan, whatever they are called, the displays reviewed here should all help to lessen the impact of frequent replacements. In several cases they also represent a new price point for their highest level of performance.

Though the price of these four monitors varies by only about 10%, there is a wide gap in their performance and features. The Sony and Thomson are clearly on top in most categories.

An occasional user with the need to make frequent adjustments might prefer the convenience of Taxan's control placement. Others might have overriding concern for an extended warrantee period and opt for the Teknika. NEC has been in the marketplace long enough to have begun experiencing some discounting and, for the present, will probably have the most attractive street price.

The Sony and Thomson both share one annoying habit that may turn some buyers away. Each of them employs a noisy relay that clicks loudly when switching between scanning rates. Anyone obsessed with quiet might find these monitors distracting if frequent changes must be made to the display mode.

However, individual preferences aside, the Sony and Thomson are better on most counts. Between the two, it is probably a matter of what satisfies the individual most. Each offers some features that the other does not. If a user does not need the NTSC and PAL capabilities, then the Sony almost certainly is the slightly better choice. It is probably also the better protection from obsolescence.

The screen-blanking utility NOFF, described in the previously mentioned article for the NEC Multisync, will also work for any of these monitors attached to an MS or PC DOS system. Particularly on a fixed-disk system, it is more convenient than adjusting the contrast and/or brightness controls even when they are easily accessible. The screen is never blanked when you don't want it to be because NOFF is not resident in memory. It must be intentionally executed. So, although it is not as essential for these monitors, it is still handy. The program is available, in limited quantities, by sending $8 ($8.52 including tax for California residents), check or money order, to W. Yacco, Box 269, Burbank, CA 91503. Specify that you want NOFF.

IBM's New Video Standards

There is well-founded speculation that the next generation of IBM PCs will be based on the 8086 and include advanced business-graphics capabilities on the planar (IBM, again, this time for the motherboard). Well, the scuttlebutt is that this machine's graphics standard will employ a new vertical-scan frequency, one that won't be compatible with any of the present conventional monitors.

There's more. According to the unconfirmed reports, it may send out a signal of 70, or so, Hertz. Remember the range of the NEC? Some multiscan monitors, such as the NEC, can only adjust the horizontal synchronization automatically. The vertical adjustment must be done manually on the NEC and it can only be done over a narrow bandwidth, 56 to 62 Hertz. Goodbye obsolescence protection.

Recently published articles have also indicated that an analog video signal similar to that of the PGC has been adopted by IBM as a similar standard for the next generation of the AT. The resolution and analog technology will be retained but the new signal is, once more, expected to have a vertical rate of 70 Hz. This would make it incompatible with all of the existing displays designed for the PGC (except some of those included in this review).

Standards once thought to be necessary only for CAD, and other demanding graphics applications, are increasingly being specified by the processors of financial data. The crude appearing representations produced by the digital display's TTL circuits may soon fall aside in favor of an analog replacement.

Most users probably do not realize the importance of color in a video picture. Yet there is a very dramatic illustration of its role with which everyone is familiar. The NTSC standard used on every ordinary American television receiver is an analog circuit. Some may mistakenly believe that the totally realistic picures they are used to seeing on an evening's programming are the result of higher resolution than they obtain from their color-graphics monitor. It is instead, the infinitely varying range of color, or shades of grey, that produces

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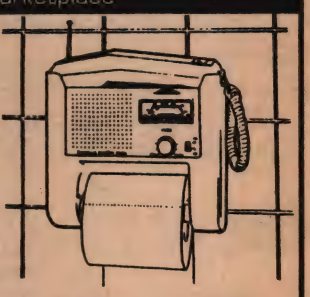

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SumTime: A Powerful Time Manager And Scheduler

by Wayne Yacco

There are four parts to SumTime. The Time Manager is the core of the system with the other three applications playing a supporting role. Supporting applications include the Letter Writer, FileDex and Terminal. There is no copy protection and networking with multiple, concurrent users is an option.

SumTime employs an interface that alone makes this product worthy of examination. A great deal of care has obviously gone into making all of the available features easily accessible despite the lack of many of the fancy, industry-buzz-word functions that are currently de-riquer for haute couture software. It is a clever piece of work because, if you're not doing a review, you'll probably never notice that they're missing. Almost everything does just what you'd want it to do—without the extra frills.

The same style of menus are used throughout the applications of the SumTime system. Menu items can be selected with a mouse or the cursor-pad movement keys. Some also have ALT-key combinations for direct access.

The system unites a combination of pull-down menus, for selecting functions, and pop-up windows for entering transactions. A limited number of pop-up windows provide both the selection of parameters and the ability to transact changes in the windows themselves.

The four applications appear in pop-up windows. In most pop-up transaction windows, there is a menu bar at the top and a control panel at the bottom for selecting available commands. The appointment-book window also has a slider for use in rapid scrolling of the window with a mouse.

Pop-up windows, including all applications except the active communications terminal, are exited by striking the end key, a protocol which is uncommon enough to take some getting used to. This precludes use of the end key for the more common function of going to the end of a line during editing. Indeed, SumTime's editing functions could profit from some improvement. An adjustment can be made, however, and an internally consistent interface, which the program does have, is the more important issue.

The status line, at the bottom of the display area, provides guidance for using the system. Information on the options which are currently available, the active application and lists of certain commands, for entering or exiting various system functions, are displayed on the line at all times.

Control panels are similar lines at the bottom of each application window. The ESCape key is typically used to gain access to the control panel and its commands may be selected with cursor keys or by typing the first letter of the command. Mouse users can access the commands directly, dispensing with the ESCape key.

Application windows may be freely sized and moved on the background area known as the workspace. Full-sized windows are the default, occupying the entire workspace except for the status line.

A key which will fully open and collapse previously down-sized windows, with a single stroke, has not been provided. Neither is it possible to scroll the window horizontally over the underlying application. One of these features should be added; a down-sized window does not allow access to all information which is off screen. This limitation significantly reduces the utility of the windows and may even raise some question as to whether these are windows or just screens. They do scroll vertically and there is a feature, called the shuttle, that overcomes some of the restrictions on windowing.

The system shuttle facility allows as many as three screens to be frozen and viewed on the workspace in quick succession. While in the shuttle mode, the windows are not functional but they may be exchanged with a single keystroke to select a desired application or, simply, to view a window's contents. Merely striking the ENTER key is enough to revive the current window.

SumTime does not have truly seamless integration; data cannot be transferred between windows. However, the shuttle provides some capacity for referencing required information. For example, the Time Manager's calendar could occasionally be referred to while preparing a letter with the Letter Writer that is to have names and addresses merged into it from FileDex. Different windows within a single application can also be switched and compared.

The primary application in the system is the Time Manager. It is a unique time-database which features a powerful graphical representation of time and its utilization. The extraordinary visibility of its interface has vast potential for development of time management and scheduling applications.

The opening screen in Time Manager's pop-up window is empty until a calendar is created. There are two pull-down menus which can be used for selecting the year and month for a desired calendar. The selected calendar month will then be loaded, if it exists, or created, if it does not exist.

Once a month is loaded, the window is divided into two parts. On the left is a calendar image made up of squares—one for each day. The format of this image is exactly like that of an ordinary printed calendar.

To the right of the calendar image is a graphic representation of one day's appointments. A single day is shown as a matrix divided into six columns and sixteen rows. Each of the sixteen rows represents an hour from 6:00 a.m. to 9:00 p.m. Columns divide the hours into ten-minute intervals. Therefore, each cell of the matrix represents ten minutes and each row of six cells adds to one hour. The labels for each hour are shown in a single column to the left of the matrix, one hourly label per row. To the left of these labels is a code column that indicates which hours have appointments of a selected type.

As the cursor is moved over the calendar's daily squares, with the cursor keys or mouse, the matrix on the right of the screen changes to show the day's schedule for the day under the cursor. The open matrix areas, available for meetings, are immediately visible for any combination of participants!

The schedule that is displayed can be made to include all appointments or limited portions of the day's agenda. Selections are made through three additional pull-down menus. These three menus contain individuals (WHO menu), sites (WHERE menu), and events (WHY menu).

All appointments for the month can be seen at a glance on the monthly calendar image. Each day's square can have one datum in each corner. The upper left corner displays the day of the month. Proceeding clockwise, the other corners provide the number of morning appointments, afternoon and evening appointments, and the day's total number of booked events.

When the selection criteria are changed, using the menus, the number of appointments displayed for each day are limited to those of the selected type. Examples might be to select conferences, situated in conference room 2, for all personnel or to select sales meetings, on customer sites, for a certain salesperson. There is also a MAKE A MEETING function which allows groups of personnel to be selected. Each of the menus can accommodate up to 32 entries. They are simply modified with INSert and DELete keys for additions and deletions respectively.

This product could also be used for special applications with only slight modification. For example, a time and billing application could be created by simply changing the contents of the Why and Where menus to contain rate and client information. Simply selecting the client, from the Where menu, could provide all hours at all rates. Focusing on a particular professional's billing for that client would require only that individual be selected from the Who menu. That person might perform different services at different rates and that could be selected from the Why menu. Choosing the TOTAL function from the control panel gives an instant sum of hours for billing purposes. In fact, this is such an obvious application, it is surprising that provision was not made to carry out rate extensions automatically.

Although a day's activities can all be seen at a glance in the matrix, there is insufficient room to include descriptions of the events. This information is exposed, for a selected day, by merely striking the ENTER key to enter the appointment-book window. The new window shows one or more lines for each time division. The time divisions may be quarter, half, or whole hours. Descriptions appear on the line to the right. Codes appear to the left of the descriptions and identify the individual (there is one line item for each individual with an appointment for a given time), the event type, and the site. Only those events which match all the selection criteria are shown.

Adding, deleting, or modifying an appointment only requires placing the cursor bar over the appropriate row and once more striking the ENTER key. An input screen appears which changes fields automatically as the data is entered. The END key returns the user to the complete schedule where the entry may be seen unless it does not correspond to the current selection criteria. Changing temporarily to ALL for each selection criterion facilitates immediate viewing of additions of all types.

The MAKE A MEETING mode allows appointments to be made, or modified, simultaneously for all members of a group. Individual members

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the apparent fidelity. EGA graphics of 640 by 350 are much higher than television's mere 320 by 525 (320 by 262.5 noninterlaced). That's 224,000 versus 168,000 pels (84,000 noninterlaced).

Both of the new standards are expected to be 640 by 480, not the 640 by 350 EGA resolution. This resolution has supposedly been observed in prototype machines currently being beta tested by large IBM customers. It is a reasonable choice both because of its current use in the PGC and because it has a four to three ratio. Since this ratio is in the same proportion as the screen dimensions of the cathode-ray tubes used in the manufacture of video monitors, an image with a four to three ratio will represent circles and squares with correct proportions.

However, the CGA or EGA owner who upgrades to this new system will at least get higher resolution. PGC buyers will have no reason to upgrade except that their equipment will arbitrarily have become obsolete. If the speculation proves true, the development of software supporting the old PGC standard will probably diminish.

Although it has not been possible to confirm, a usually reliable source has recently disclosed that he was approached by a liquidator with 12,000 IBM monitors. The liquidator claimed to have purchased the entire inventory of IBMs PGC-compatible monitors. When this information is viewed in light of the reports of a new 70 Hz vertical scan rate, it makes perfect sense. IBM could be discontinuing the PGC and its display. Any user planning a PGC purchase may want to think about the feasibility of a short postponement until the dust settles and the truth comes out. ●

SumTime continued from page 318

may be later be added or deleted singly.

There is a TOTALS function that allows the bookings to be totaled for the rows and columns. Each row total is the number of appointments for the week. Column totals show how bookings are distributed among the days of the week, i.e., how many fall on a Monday, how many on a Tuesday, etc.

A GRAPH function allows every hour in an entire month to be graphically represented on one screen. The individual scheduled for each appointment is indicated with a symbol key and legend. Meetings are necessarily shown only as hash-marked blocks due to the inability to display more than one symbol in a given space.

Nine levels of authorization, and password protection, are supported for networking. The supervisory authorization level has control of assignments. Users may access all appointments, but those booked by users with higher levels can be restricted. Restricted bookings do not include information as to the nature of the activity, only the commitment of the block of time. The ability to erase a calendar can also be restricted.

Use of a separate program to execute the authorization assignments allows the required diskette to be locked in a safe. So long as the security program is never loaded on a fixed disk, system intrusion becomes much more difficult.

The FileDex file manager and the Letter Writer word processor are both handy for preparing a quick letter or memo for activities related to the calendar. Neither is very full featured when compared to most stand-alone products, except at the very low end of the market.

FileDex has a primitive editing capability and record size is limited to 74 characters. Setting up fields is simple and fast. FileDex does sorts on any one field allowing the selected records to be either included in, or excluded from, the records extracted from the file. Although minimalist, it is virtually perfect for its intended purpose of providing the Letter Writer with a merge facility.

Letter Writer has several desirable features found in more comprehensive packages but some seem to function less satisfactorily than do the larger versions. This junior word processor offers file management, a tab ruler, type-through mode, and block commands for cut, paste, and copy. The print facility provides a clever graphical margin-setting display that makes it easy to set or change margins. The developers at SumWare have no pretensions about this facility, it is quite suitable for writing brief letters. On the exterior of the packaging, it is modestly referred to as a powerful text editor.

The terminal program is a Televideo 925-terminal emulation. It allows substantial flexibility in telecommunications-protocol selection supporting either COM1 or COM2, and speeds (incorrectly identified as baud rates) from 50 to 9600 bits per second. There is a wide selection of character bits, stop bits, and parity. Telecommunication modes are provided for full duplex, half duplex, local, and block modes, with local or duplex echo of edit keys, and Xon/Xoff supported. Normal- or reverse-video display is available.

While SumTime is being positioned as a desktop manager, it does not really seem to fit well into that category. Nor does it appear to be well rounded enough to qualify as a serious competitor there. That positioning seems to be a matter of convenience while its own uniqueness is discovered by the marketplace. The good news for SumWare is that SumTime probably won't have to compete in the desktop market.

SumTime is really superb as a time manager, with capabilities far beyond those of a simple calendar. It also has the potential in applications, such as the billing example, as a graphical time database. The facility for export into Lotus 1-2-3, or ASCII, files offers tremendous opportunity for the development of templates. It would be interesting to see what might happen if the ability to search and manipulate the data internally were enhanced in future versions. In any case, SumTime can be expected to beneficially impact the practice of management.

Although SumTime has a cute name, and comes from a company with a cute name, and even attempts to be still cuter with its slogan "a timely organizer," it has heavy-duty features that will cut off the laughing as soon as it is seen in action. A network license allows use on a single file server without limit to workstations. The list of supported networks is practically all inclusive. At less than $90 (they'll give you back a nickel to put toward shipping and handling charges), the single-user version is a block buster and, for a hundred dollars more, the network version is enough to sober the last snicker. SumWare is also busily at work, continually upgrading the product. By the time this is published, there will already be enhancements!

For now, SumTime has this application all to itself but SumWare must struggle to create a position as distinct as the product. Either SumWare must inform the management community or wait until they learn on their own how to profit from this type of manager. User's who are first to develop imaginative applications for this product will undoubtedly take a competitive lead in the area of personnel productivity. ●

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TS 806 KIT & PARTS
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TS806 Complete + 20 Mb HD & Controller PCB $1247

TS800 Work Stations with above package ..... $499, 3/$1350

TS816 KIT & PARTS
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Case & PCB Combo & all docs. (no tape drive) $599
40 Mb, 8" Quantum HP & Controller PCB $999
Case & PCB & Hard Drive & Controller $1499

TS802 — TS802H UPGRADE KIT
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TS1602 - 250K/1mb 8088 CPU, 8087 (math processor), 8089 (I/O Processor), NEC 7220 (graphics controller), supports CP/M 86, 2-DSDD 40T floppies & hard drive.

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TS1605 - IBM PC compatible - 128K/320K/512K, 8088 CPU. Supports all IBM PC software, includes color video, floppy controller, hard drive interface, mouse & bus extension.

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Coming Events

If you know of or have a trade show, swap meet or club meeting connected with the computer field, we'll run an announcement in the COMING EVENTS section FREE of charge.

MARCH 1987

March 21, 1987
The BAY AREA COMPUTER SWAP will be held at the Cow Palace in San Francisco, California. The show will be open to the public from 10:00 am to 5:00 pm. Admission is $5.00. Children under 12 are free. This is a one day personal computer swap meet where thousands of new and used products will be available for immediate purchase by show attendees.

For additional information contact MicroShows, 1209 Donnelly Avenue, Suite 203, Burlingame, CA 94010; (415) 340-9113.

March 22, 1987
The PITTSBURGH COMPUTER FAIR will be held at the Holiday Inn-McKnight Road, located at 4859 McKnight Road, just five minutes north of downtown Pittsburgh. Open to the public from 10 am to 4 pm. Admission is $3.50. For additional information call (201) 533-1991.

March 23-25, 1987
The 6th Annual INTERNATIONAL SPECTRUM U.S.A. '87 will be held at Bally's Las Vegas. This conference is produced by the International Database Management Association, Inc. for manufacturers, software publishers, resellers and user of Pick and Pick-compatible business computer systems. For additional information contact IDBMA, 9740 Appaloosa Road, Suite 104, San Diego, CA 92131; (619) 578-3152.

March 26-29, 1987
The twelfth annual WEST COAST COMPUTER FARIE will be held at Moscone Center in San Francisco. Geared to sophisticated computer enthusiasts and business professionals. For additional information contact The Interface Group, Inc., 300 First Avenue, Needham, MA 02194; (617) 449-6600.

March 29, 1987
The ROCKLAND COUNTY COMPUTER FAIR returns to the Holiday Inn-Suffern, New York, located at exit 14B of the N.Y. Thruway. The hotel is just 30 minutes from New York City and is 5 miles from the intersection of the Garden State Parkway with the Thruway. Open to the public from 10 am to 4 pm. Admission is $4.00. For additional information call (201) 533-1991.

March 30-April 2, 1987
The fifteenth annual INTERACE '87 CONFERENCE AND EXPOSITION will be held at the Las Vegas Convention Center in Las Vegas, NV. Geared to large-scale corporate, government, financial and institutional users. For additional information contact The Interface Group, 300 First Avenue, Needham, MA 02194; (617) 449-6600.

APRIL 1987

April 5, 1987
The 14th LANCASTER HAMFEST sponsored by Sercom, Inc. will be held Saturday, April 5, 1987 at the Overlook Roller Rink from 8 am to 2 pm. Vendors setup at 7am. Admission is $4.00. $5.00 per space for tailgating. Tables $10, perimeter or w/electricity $12. Overlook Roller Rink is located on RTE 501 just one mile north of the RTE 30/501 intersection 2 miles north of Lancaster, PA. XYLs free. Talk-in 146.01/61 or 147.015/615. For additional information SASE to Hamfest Committe, P.O. Box 6082, Lancaster, PA 17603.

April 6-7, 1987
The PUBLISHERS WORKSHOP will be held at the Hyatt Regency Hotel in Fort Worth, Texas. The sponsor of this workshop is Tandy Corporation/Radio Shack Education Division. For additional information contact Tandy Corp., 1700 One Tandy Center, Fort Worth, TX 76102; (817) 390-3487.

April 7-9, 1987
FOURTH ANNUAL INTERNATIONAL CONFERENCE ON TECHNOLOGY AND EDUCATION: "A WORLD REVIEW" will be held at the Hyatt Regency Hotel in Fort Worth, Texas. The sponsors of this conference will be Tandy Corporation/Radio Shack Education Division, The University of Texas Department of Continuing Education, The University of Tennessee, The University of Edinburg (Scotland) School of Artificial Intelligence. For additional information contact Tandy Corp., 1700 One Tandy Center, Fort Worth, TX 76102; (817) 390-3487.

April 11-12, 1987
The Commodore Association South/East (C.A.S.E.) presents the 1987 COMMODORE SHOW at the Opryland Hotel in Nashville, Tennessee. Show time is 9:00 am to 5:00 pm. National Commodore Speakers! Vendors and Displays! Show Specials and Door Prizes! See Innovations Available for the Commodore Market! The Only Commodore Conference in the South East! User Group Oriented! Win a Fully-Loaded Amiga! For additional information contact C.A.S.E., P.O. Box 110386, Nashville, TN 37222; (615) 834-5679; (615) 834-2073.

April 11-12, 1987
The 12th Annual TRENTON COMPUTER FESTIVAL will be held at the Trenton State College Recreation Center. For additional information contact Trenton State College, Hillwood Lakes CN4700, Trenton, NJ 08650-4700; (609) 771-2487.

April 11-12, 1987
The FORT WORTH CAMERA & COMPUTER SHOW will be held at Argon Carter Exhibit Hall. For additional information contact Bob Norman (817) 732-1194.

April 11-12, 1987
The COMPUTER SUPERMARKET SHOW AND SALE will run for two days at the Santa Clara Convention Center in Santa Clara on Saturday and Sunday. The show will be open to the public from 10 am to 5 pm Saturday, and 10 am to 4 pm Sunday. Admission is $6.00 and children under 12 are admitted free. This computer show will have thousands of new products that will be available for immediate purchase by show attendees. For additional information contact MicroShows, 1209 Donnelly Ave., Suite 203, Burlingame, CA 94010; (415) 340-9113.

April 26, 1987
The COMPUTER CENTRAL BARGAIN FEST will be held at the University of Illinois, Chicago Circle Center-Illinois Room, 750 S. Halsted Street, Chicago, IL. Hours 9:30 am to 4 pm. Exhibitor tables $60.00. Admission $5.00. Open to general public. Show features bargain prices in hardware, software, games, supplies, peripherals, furniture, etc. For dealer reservations, information call (312) 940-7547.

MAY 1987

May 2-3, 1987
The 1987 MIDWEST TIMEX/SINCLAIR COMPUTER FEST will be held at the Holiday Inn North in Indianapolis, Indiana. Dealer and Seminar Speaker Banquet will be held Friday May 1, at 8 pm. Fest times will be Saturday May 2—9 am to 6 pm; Sunday May 3—9 am to 5 pm. For additional information contact Ralph McCrum, P.O. Box 1161, Mishawaka, IN 46544.

May 3, 1987
The DELAWARE COMPUTER FAIR returns to the Ramada Inn, New Castle, Delaware, located at the intersection of I 295 and RT 13, just a short trip from Maryland and Philadelphia. Our last show was a sell out, so we have taken additional space and will have room for more than 100 tables. Open to the public from 10 am to 4 pm. Admission is $3.50. For additional information call (201) 533-1991.

May 3, 1987
The COMPUTER/CAMERA/VIDEO SWAP MEET will be held at the Century Center, downtown South Bend, Indiana from 10am-4pm; exhibitor set-up 8am.

For additional information contact Roger L. Smith, P.O. Box 6486, South Bend, IN 46544; (219) 259-2968 before 9:30pm EST.

May 10-14, 1987
The APL87, the international APL conference will be held at the Fairmont Hotel in Dallas, Texas. For additional information contact APL87 Registrar, 440 Northlake Shopping Center, Suite #210, Dallas, TX 75238.

JUNE 1987

June 1-4, 1987
The seventh annual COMDEX/Spring will be held at the Georgia World Congress Center in Atlanta, GA. Geared to computer industry resellers and marketers. For additional information contact The Interface Group, 300 First Avenue, Needham, MA 02194; (617) 449-6600.

June 14, 1987
COMPUTER CENTRAL MULTI-VENDOR PC SHOW will be held at the Holiday Inn Itasca, 860 Irving Park Road, Itasca, IL from 9:30 am to 4:00 pm. This multi-vendor PC show is for everyone. Over 50 vendors selling! Bargains galore! Printers, monitors, disk drives, games, furniture, computers, keyboards, diskettes, parts, expansion boards. Apple; Atari; IBM; "Clones"; Commodore; Tandy. Admission is $4.00; Children 8-12 is $2.00. For additional information call (312) 940-7547.

June 15, 1987
The NATIONAL COMPUTER CONFERENCE will be held in Chicago, Illinois, McCormick Place. This conference provides an innovative forum where significant computing developments and trends in technology are announced, discussed and displayed through a comprehensive technical program including exhibits and presentations. For additional information contact NCC '87, AFIPS, 1899 Preston White Drive, Reston, VA 22091; (800) NCC-1987.

June 15-18, 1987
The NATIONAL COMPUTER CONFERENCE (NCC '87) provides an innovative forum where significant computing developments and trends in technology are announced, discussed and displayed through a comprehensive technical program including exhibits and presentations. For additional information contact NCC '87, AFIPS, 1899 Preston White Drive, Reston, VA 22091; (800) NCC-1987

June 29-July 3, 1987
WORKSHOP IN COMPUTER-ASSISTED INSTRUCTION IN MUSIC. The Lab for Computer-Assisted Instruction in Music at Brooklyn College will be offering a workshop for music teachers who are interested in using computers as a teaching tool. Each workshop will last 5 days and include 15 hours of classroom instruction. Cost: $250/workshop. Offered in affiliation with the Center for Computer Music at Brooklyn College. For further information and an application, contact: Gary S. Karpinski, Director, Lab for CAI in Music, Conservatory of Music, Brooklyn College, Brooklyn, NY 11210; (718) 780-5286.

JULY 1987

July 6-10, 1987
WORKSHOP IN COMPUTER-ASSISTED INSTRUCTION IN MUSIC. The Lab for Computer-Assisted Instruction in Music at Brooklyn College will be offering a workshop for music teachers who are interested in using computers as a teaching tool. Each workshop will last 5 days and include 15 hours of classroom instruction. Cost: $250/workshop. Offered in affiliation with the Center for Computer Music at Brooklyn College. For further information and an application, contact: Gary S. Karpinski, Director, Lab for CAI in Music, Conservatory of Music, Brooklyn College, Brooklyn, NY 11210; (718) 780-5286.

July 13-17, 1987
WORKSHOP IN COMPUTER-ASSISTED INSTRUCTION IN MUSIC. The Lab for Computer-Assisted Instruction in Music at Brooklyn College will be offering a workshop for music teachers who are interested in using computers as a teaching tool. Each workshop will last 5 days and include 15 hours of classroom instruction. Cost: $250/workshop. Offered in affiliation with the Center for Computer Music at Brooklyn College. For further information and an application, contact: Gary S. Karpinski, Director, Lab for CAI in Music, Conservatory of Music, Brooklyn College, Brooklyn, NY 11210; (718) 780-5286.

COMPUTER SHOWS and FLEAMARKETS

MARCH 29 Sunday 10-4	IBM & CLONE SHOW-Boston - 225 Tables Sheraton Hotel - Boxborough I-495 Exit 28
APRIL 5 Sunday 10-4	LONG ISLAND, NY SHOW - 250 Tables Grand Royal Hotel-Hempstead-Clinton St
MAY 9 Saturday 10-4	BOSTON AREA SHOW - 350 Tables N.E. Trade Ctr.-Woburn-Exit #35 I-95 - 128
MAY 16 Saturday 10-4	SOUTH JERSEY SHOW - 300 Tables Betsy Ross Inn - Pennsauken, NJ - Rte. 130
JUNE 6 Saturday 9-4	NORTH JERSEY SHOW - 400 Tables/Spots Meadowlands Hilton-Secaucus, NJ - Rte. 3
JUNE 13 Saturday 10-4	MARYLAND/DC/VA SHOW - Sheraton Hotel New Carrollton, MD - Exit 20-B of I-95
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(All Shows Are From 10:00 A.M. — 4:00 P.M.)
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1987 Exams For Computer Professionals

The 1987 examination dates for the Associate Computer Professional (ACP), Certified Computer Programmer (CCP), Certified Data Processor (CDP) and Certified Systems Professional (CSP) have been set by the Institute for Certification of Computer Professionals (ICCP).

All examinations will be given on May 9 and November 14 at 160 test site locations in the United States and abroad. The cutoff dates for receipt of applications are Apr. 1 for the May 9 examination and Oct. 1 for the Nov. 14 examination.

The ACP examination is an entry level examination for students or recent graduates from computer programs in one, two or four year colleges. It also is applicable to persons who have been working in the computer field for a short period of time. The examination contains a general section for all candidates as well as six specialty program language sections from which the candidate chooses. They are Fortran; Pascal; BASIC; RPG; COBOL; and "C." The November exam will include an Ada language section.

The CCP is intended to help establish recognized professional standards for senior-level computer programmers. The exam covers a general section and three specialties: Systems; Business; and Scientific Programming.

The CDP was created to help establish recognized professional standards within the data processing industry. To qualify, a candidate must meet the specific professional requirements and pass all five sections of the examination. By the way, ICCP will celebrate the 25th anniversary of the CDP examination this year.

The CSP was designed to help identify systems practitioners who have attained a specified level of knowledge and experience in the principles and practices of systems, information resource management and related disciplines.

All of the examinations, with the exception of the ACP, require recertification every three years for those who pass. The ICCP recertification program is designed to assist computer professionals in remaining current in the computer industry.

For further information or to obtain announcements and applications, contact the ICCP, 2200 East Devon Ave., Suite 268, Des Plaines, IL 60018 or call (312)299-4227.

Mention that you read about it in *Computer Shopper*. ●

AIC *Plus* To Go On-Line

Patch Communications has announced that the electronic version of its Aircraft Multilisting Service for aircraft dealers will go on-line March 1, 1987. This new electronic service will provide aircraft dealers with an international electronic marketplace for the sale of used airplanes. A dealer who subscribes to the service will be able to locate the exact plane wanted by a customer. Aircraft for sale will be listed on the electronic board accessible to possible buyers throughout the world.

AIC *Plus* is available to run on personal computers, or if a PC is not available, AIC can supply a pre-programmed intellegent terminal that requires no experience to operate. Dial-up and log-on procedures are accomplished automatically with a single key press.

Patch Communications publishes *Computer Shopper*, *PC Clones* and *Shutterbug* magazines. AIC *Plus* is their first venture into the growing field of electronic publishing.

```
LOGON at  : [date] [time]
Last LOGON: [date] [time]
 AIC Plus Menu:

AIC Listings          Membership Directory
Conference            N Number Search
DELPHI                OAG(Airline Guide)
Dealer Forum          TELEX
Easy Sabre            Turkey Listings
Entry Log             Using AIC Plus
Liens&Collateral      Exit
Mail

MAIN> What do you want to do?
```

Xerox Desktop

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Ventura Publisher. The system is priced $5,495. (Priced separately, system components cost $7,125.)

Model 606: Includes full-page display; 4045 Model 50 laser printer/copier with 1.5 megabytes of memory; and Xerox Ventura Publisher. The system is priced at $7,995. (Priced spearately, system components cost $8,545.)

Model 607: Includes full-page display and Xerox Ventura Publisher. The system is priced at $2,195. (Priced separately, system components cost $2,215.)

Xerox Desktop Publishing Systems are available nationwide from Xerox sales representatives, sales agents and selected Xerox authorized dealers.

For more information contact: Xerox Corporation, Xerox Square 006, Rochester, New York 14644, 716 423-5078.

Mention that you read about it in *Computer Shopper*. ●

Portable Computers

continued from page 292

size 84-key detachable keyboard; 8 MHz 80287 coprocessor socket; parallel printer interface; asynchronous communications interface and RGBI interface for connection to a color monitor. U.S. suggested resale price: $5,799.

● Options for the Compaq Portable III include: Memory Expansion Board; 512 Kilobyte Memory Option Kit; 2 Megabyte Memory Option Kit; plug-on Expansion Unit; ⅓-height, 360 Kilobyte diskette drive; high performance, shock mounted 20- or 40 Megabyte, 3.5-inch fixed disk drives; 300/1200 baud internal Hayes compatible modem; 8 MHz 80287 coprocessor; tilt & swivel desktop pedestal; carrying case in nylon or leather; Compaq Portable III technical reference manual; MSDOS Version 3.2; Compaq Color Monitor and Compaq Enhanced color Graphics Board.

Compaq Computer Corporation offers the broadest and most comprehensive line of desktop and portable business personal computers. The company's products range from the new 80386-based Compaq Deskpro 386 which uses a 16 MHz 80386 microprocessor, to the 8086-based Compaq Deskpro, to the Compaq Deskpro 286, to the world's best-selling portable personal computer, the Compaq Portable II—and now, the Compaq Portable III. ●

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6116L	120ns	1.95
6116L	150ns	1.75
6116P	150ns	1.60
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4016	150ns	1.60
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5565 PL	150ns	3.50
5564 PL	150ns	5.25

Z 80 FAMILY

Z80A	CPU	4mhz	1.20
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Z80A	DART	4mhz	2.75

8000's

8031AH	5.25	8243	2.00
8035	1.95	8250A	3.95
80C35	3.75	8251A	1.65
8039	2.79	8254	3.75
80C39	4.00	8253-5	1.75
8085A	1.75	8255A-5	1.80
8086	5.00	8274	4.75
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8156	2.25	8288	5.25
8212	1.60	8748H	6.75
8216	1.60	8749H	8.25
8226	1.95	8224	3.50
8237A-5	4.75	8228	3.50

INTERFACE:

1488	0.32	1489	0.32

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	27256	250ns	4.75
	27C256	200ns	6.70
	27256	200ns	5.90
	27128	150ns	4.75
	27128	200ns	4.50
	27C64	150ns	4.25
	2764	200ns	3.60
	2764	250ns	3.10
	2564	450ns	7.50
	2764A	250ns	3.60
	2732A	200ns	3.90
	2732A	250ns	3.70
	2732	450ns	3.50
	2532	450ns	4.50
	2716	350ns	3.80
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Bulletin Board

The Bulletin Board is a regular feature of the *Computer Shopper*. This is where you can list your public access community bulletin board or Remote System at no charge. All listings are in sys:fone number sequence. If you would like to have your Remote System listed, follow the instructions listed below:

Submission Policy

All Remote System entries must be submitted in **writing** by the first of every month and must include the sys:fone number for the system. **Submissions received by the first of April will appear in the June issue.** The listing will be good for three issues thereafter unless we receive notice that it contains an error.

PRACSA (Public Remote Access Computer Standards Association, (data; 415-948-2513) and **FOG** (P. O. Box 3474, Daly City, CA, 94015, data: 415-755-8315) are organizations devoted to the enhancement of the computer experience. Therefore members of these two organizations are now assisting in the maintenance and verification of entries in **The Bulletin Board**.

A large percentage of the listings received have been voice numbers not associated with Remote Systems. This is an inconvenience for owners of the phone numbers which must be eliminated.

FOG and **PRACSA** members will attempt to verify that each listing is in fact a remote system. If a listing is found to be inaccurate, it will immediately be deleted from the listing. **If an update report is not received** every three months, the listing will also be deleted. All SysOps are responsible for promptly forwarding accurate information to:

FOG
Remote System listing
P. O. Box 3474
Daly City, CA 94015-0474

We are not responsible for errors published in these listings.

(201)223-2834, **The Krimson Kastle** -- Wall, NJ. 300/1200 baud, online 24 hrs. SysOp: Unknown. Downloads, Games, SIGs, Casino, Adventures, Textfiles, GBBS 'Pro' Mods, BBS store, Largest BBS list.

(201)233-9148, **The Tarantula's Nest** -- Westfield, NJ. 300/1200 baud, online 24 hrs. SysOp: Dave Grabowski. C64 & C128, all computers welcome.

(201)261-1977, **Contest Board** -- New Milford, NJ. 300 7/E/1 baud, online 24 hrs. SysOp: David J. Fischer. Online games with contests and prizes.

(201)265-2481, **Dial-Your-Match -399** -- New Milford, NJ. 300/1200 baud, online 24 hrs. SysOp: David J. Fischer. (Oracomm#19) Computerized dating and meeting system..

(201)272-2073, **FOG -41** -- Elizabeth, NJ. 300/1200 baud, online 24 hrs. SysOp: George Porcella. Jersey Osborne Group (FOG AMO #138) member supported system. **PRACSA member**

(201)297-7399, **Pan World Internat.** -- North Brunswick, NJ. 300/1200 baud, online 24 hrs. SysOp: Alex & David Lin. CAD/CAM, LAN, AD/DA + I/0, 20Mb program download. IBM-PC, Apple, Mac, Commodore, CP/M, Hunt 8/N/1.

(201)297-7410, **Pan World Internat.** -- North Brunswick, NJ. 300/1200 baud, online 24 hrs. SysOp: Alex & David Lin. CAD/CAM, LAN, AD/DA + I/O, 20Mb program download. IBM-PC, Apple, Mac, Commodore, CP/M, w/o Hunt, 8/N/1.

(201)370-8021, **The Syndicate (South)** -- Lakewood, NJ. 300/1200 baud, online 24 hrs. SysOp: Wayne Miller. AT ASCIIASCII.

(201)377-1803, **First Amendment - -7** -- Florham Park, NJ. 300 baud, online 24 hrs. SysOp: Andrew White.

(201)379-5882, **The Thieves Guild** -- Sprinfield, NJ. 300/1200 baud, online 24 hrs. SysOp: Unknown. Commodore C64/C128.

(201)381-4107, **Tele-Master:Speed-Line** -- ????, NJ. 300/1200 baud, online 24 hrs. SysOp: Gary Spiewak.

Ring Back (Let ring once, and then call back).

(201)389-1024, **T.P.S. Night Watchman** -- Eatontown, NJ. 300/1200 baud, online 10pm-10am. SysOp: Chris Boaro.

(201)542-0427, **Software Etc. BBS** -- Eatontown, NJ. 300/1200 baud, online 10pm - 10am. SysOp: David Brien D. B. Dalton's BBS. Download files for Macintosh, Commodore, Apple, IBM, Atari and Amiga..

(201)587-0618, **The Amusement Park** -- Maywood, NJ. 300/1200 baud, online 9PM-7AM. SysOp: Unknown.

(201)654-1680, **Attic-Static-DDial -41** -- Westfield, NJ. 300 baud, online 24 hrs. SysOp: David Modoski.

(201)743-4850, **Flash-Talk - DDial -35** -- Bloomfield, NJ. 300 baud, online 24 hrs. SysOp: Jim Schott.

(201)753-9758, **ACGNJ BBS** -- Central, NJ. 3/12/24 baud, online 24 hrs. SysOp: Kevin Tillbrook. MS-DOS, CP/M, UNIX, XENIX, C.

(201)798-0065, **Computer Connections** -- Hoboken, NJ. 3/12/24 baud, online 24 hrs. SysOp: Ed Mecka. Supporting CP/M and MS-DOS P.D. software exchanges..

(201)839-9440, **Frankly Speaking - -40** -- Pompton Lakes, NJ. 300 baud, online 24 hrs. SysOp: Frank Cahill.

(201)848-8217, **FOG -49** -- Wycoff, NJ. 3/12/24 baud, online 24 hrs. SysOp: Peter Zuroff. **PRACSA member**

(201)852-7335, **Intelenet EMS** -- Hackettstown, NJ. 300/1200 baud, online 24 hrs. SysOp: Mark S. Bond. Apple users forum featuring return receipt mail.

(201)861-7680, **InterCHAT - DDial -17** -- North Bergen, NJ. 300 baud, online 24 hrs. SysOp: Dan Pluchino.

(201)963-3115, **Police Station TBBS** -- Hoboken, NJ. 3/12/24 baud, online 24 hrs. SysOp: Ronald Clark.

(201)972-8731, **Beyond Reality - -3** -- Morganville, NJ. 300 baud, online 24 hrs. SysOp: Marc Andrews.

(201)988-9489, **The Magic Bag** -- Neptune, NJ. 300/1200 baud, online 24 hrs. SysOp: Matthew Jones.

(202)488-4709, **Home-DBA** -- Washington, DC. 1200/2400 baud, online 24 hrs. SysOp: Mark Findley. IBM.

(203)268-5794, **Jobpost** -- Monroe, CT. unknown baud, online 24 hrs. SysOp: Unknown. Job search.

(203)277-2931, **Connecticut Yankee BBS** -- Hartford, CT. 1200 baud, online 24 hrs. SysOp: Unknown. Written registration required for increased access Sysop cannot be paged.8/N/1..

(203)698-0588, **StarPort** -- Old Greenwich, CT. 3/12/24 baud, online 24 hrs. SysOp: Jim Bolster.

(203)792-1328, **The Tardis** -- Danbury, CT. 300/1200 baud, online 24 hrs. SysOp: Lynda Mueller.

(204)832-4593, **Muddy Water Osborne Gp** -- Winnipeg, Manitoba. unknown baud, online 24 hrs. SysOp: Terry Smythe. Serious CP/M, SIG for Vector Graphics models 2, 3, & 4 and Ibex.

(204)837-9044, **The Unsound Mind BBS** -- Winnipeg, Manitoba. 3/12/24 baud, online 24 hrs. SysOp: Doug Donahue.

(204)857-6366, **Smitty's Place** -- Portage laPrairie, Man. unknown baud, online 10:30pm-4am. SysOp: Robert Smith.

(204)888-0498, **ROM Board** -- Winnipeg, Manitoba. unknown baud, online 24. SysOp: Donald Bayomi.

(205)633-0011, **The Dark Side BBS** -- Mobile, AL. 300 baud, online 24 hrs. SysOp: Unknown.

(205)645-0628, **The Hotel California** -- Mobile, AL. 300 baud, online 24 hrs. SysOp: Unknown.

(205)880-1290, **Date Line Huntsville** -- Huntsville, AL. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm#26).

(206)235-8760, **Electronics System** -- Renton, WA. 3/12/24 baud, online 24 hrs. SysOp: Unknown. Latest releases for PD software, Home board for Omniverse (tm).

(206)241-8963, **Bytes & Pieces** -- Seattle, WA. unknown baud, online ?? hrs. SysOp: Bill&Cindy Bowman. Official BBS of Atari Trek 87.

(206)361-0895, **Queen Anne Computer** --. unknown baud, online ?? hrs. SysOp: Unknown.

(206)365-6938, **New World BBS** --. unknown baud, online ?? hrs. SysOp: Unknown.

(206)459-7579, **Polynet Public Systems** -- Seattle, WA. 300/1200 baud, online 24 hrs. SysOp: Dan Cascioppo. Supports all computers, CB simulator between ports, online adventuring,Polynet System Users group.

(206)481-9752, **USS Liberty Vet Assoc.** -- Seattle, WA. unknown baud, online ?? hrs. SysOp: Unknown. U.S.S. Liberty Veterans Association BBS.

(206)491-4143, **Halls Of Olympus** -- Lacy, WA. 300/1200 baud, online 24 hrs. SysOp: Unknown. Supports TRS-80, but welcomes all computer users..

(206)537-4267, **Globe Quest** -- Spanaway, WA. 300/1200 baud, online 24 hrs. SysOp: Scott Sattlerr.

(206)564-5533, **Polynet Public Systems** -- Seattle, WA. 300/1200 baud, online 24 hrs. SysOp: Dan Cascioppo. Supports all computers, CB simulator between ports, online adventuring,Polynet System Users group.

(206)598-3228, **Bainbridge Island** --. unknown baud, online ?? hrs. SysOp: Unknown.

(206)621-9312, **Intelephone** -- Seattle, WA. 300/1200 baud, online 24 hrs. SysOp: Unknown. Apple/IBM/Atari/Commodore.

(206)641-5884, **TIBBS NW** -- Bellevue, WA. unknown baud, online ?? hrs. SysOp: Unknown.

(206)643-6948, **Match Up** -- Bellevue, WA. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #14).

(206)736-2628, **Lewis County Commodore** -- Centralia, WA. unknown baud, online 7pm - 9am. SysOp: Rick Beaber.

(206)742-9034, **Teletravel** --. unknown baud, online ?? hrs. SysOp: Unknown.

(206)783-9798, **Polynet Public Systems** -- Seattle, WA. 300/1200 baud, online 24 hrs. SysOp: Dan Cascioppo. Supports all computers, CB simulator between ports, online adventuring,Polynet System Users group.

(206)784-3217, **Polynet Public Systems** -- Seattle, WA. 300/1200 baud, online 24 hrs. SysOp: Dan Cascioppo. Supports all computers, CB simulator between ports, online adventuring,Polynet System Users group.

(206)784-3218, **Polynet Public Systems** -- Seattle, WA. 300/1200 baud, online 24 hrs. SysOp: Dan Cascioppo. Supports all computers, CB simulator between ports, online adventuring,Polynet System Users group.

(206)784-4142, **Puget Sound 99ers BBS** -- Seattle, WA. unknown baud, online ?? hrs. SysOp: Unknown.

(206)784-9776, **Polynet Public Systems** -- Seattle, WA. 300/1200 baud, online 24 hrs. SysOp: Dan Cascioppo. Supports all computers, CB simulator between ports, online adventuring,Polynet System Users group.

(206)824-6757, **Trothguard** --. unknown baud, online ?? hrs. SysOp: Unknown.

(206)839-3415, **Dial-Your-Match -47** -- Redondo, WA. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #07).

(206)878-0158, **Radio 1** --. unknown baud, online ?? hrs. SysOp: Unknown.

(206)883-7529, **B.R.A.C.E. BBS** -- Seattle, WA. unknown baud, online ?? hrs. SysOp: Jeff Popp. Official BBS of Atari Trek 87.

(206)885-4636, **Shuttle** --. unknown baud, online ?? hrs. SysOp: Unknown.

(207)465-7288, **The Circuit Board** -- Fairfield Ctr., ME. 300 baud, online 6p-10p M-F. SysOp: Jim Sammons.

(207)883-9163, **The Nutcase Place** -- Scarboro, ME. 300 baud, online 24 hrs. SysOp: Chris Keenan.

(207)967-3719, **Telecommunicator's BBS** -- Kennebunkport, ME. 300/1200 baud, online 24 hrs. SysOp: Rick Lembree. 8/N/1, beginning 3rd year online. 24-hour voice helpline: 207-967-3381.

(209)222-1057, **Over World BBS** -- Fresno, CA. 300 baud, online 24 hrs. SysOp: John Toner. Atari only.

(209)526-9987, **Programmers Retreat** -- Modesto, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(212)249-9416, **Kashmir** --. 1200 baud, online ?? hrs. SysOp: Unknown.

(212)289-5253, **PC-Asylum** --. 2400 baud, online ?? hrs. SysOp: Unknown.

(212)340-9666, **The Machine** --. 2400 baud, online ?? hrs. SysOp: Unknown.

(212)348-5714, **Laserboard** --. 2400 baud, online ?? hrs. SysOp: Unknown.

(212)431-1254, **Invention Factory** --. 2400 baud, online ?? hrs. SysOp: Unknown.

(212)489-7370, **FOG -15** -- New York City, NY. 300/1200 baud, online 24 hrs. SysOp: Livingston Hinkley. New York Osborne Users' Group (FOG AMO #135) member supported system. **PRACSA member**

(212)496-7946, **Datacom** --. 2400 baud, online ?? hrs. SysOp: Unknown.

(212)579-2869, **Fordham** --. 2400 baud, online ?? hrs. SysOp: Unknown.

(212)581-8251, **Not Just BBS** -- New York, NY. 300/1200 baud, online 24 hrs. SysOp: Randy&Elli Fordyce. Small- and home-business, writers, editors, consultants, music SIGs.

(212)601-6511, **Clarford Int'l Spec.** -- Riverdale, NY. 300/1200 baud, online 9am-7pm. SysOp: Clarence Norman. IBM Compatibles, Commodore, Apple. Entrepreneur, barter, trade, sell worldwide. No membership fee..

(212)619-4710, **Beast of the East** -- New York, NY. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #39).

(212)645-9484, **NYMUG** --. 1200 baud, online ?? hrs. SysOp: Unknown.

(212)662-8597, **The Doctor's Offic BBS** -- New York, NY. 1200/2400 baud, online 24 hrs. SysOp: Neil Leder. For IBM and compatibles only.

(212)677-3460, **Gramercy Park BBS** -- New York, NY. 300/1200 baud, online 24 hrs. SysOp: Eran Newman. Science Fiction, Music, Buy-Sell conferences.

(212)696-0360, **PC Magazine** --. 1200 baud, online ?? hrs. SysOp: Unknown.

(212)697-1809, **NYPC BBS** -- New York, NY. 1200 baud, online ?? hrs. SysOp: Donald David. Electronic info exchange for NYPC members (8 DB/1 SB/NP).

(212)764-5912, **UNITEX** -- New York, NY. 300/1200 baud, online ?? hrs. SysOp: Robert Osband. Info about United Nations.

(212)826-8827, **TextBase** --. 2400 baud, online ?? hrs. SysOp: Unknown.

(212)889-6438, **RAMNET BBS** --. unknown baud, online ?? hrs. SysOp: Ross Greenberg.

(213)227-9684, **VCC BBS** -- Burbank, CA. 300/1200 baud, online 24 hrs. SysOp: Wes Arnold.

(213)394-5950, **BR's BBS** -- Santa Monica, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #31).

(213)402-7631, **The Lions Den BBS** -- Cerritos, CA. 300/1200 baud, online 1pm-7am. SysOp: Robert Cross.

(213)656-6554, **Christopher Street Wes** -- West Hollywood, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #36).

(213)947-7777, **99 BBS** --. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(214)238-1016, **Dallas Connection/PARC** -- Dallas, TX. 3/12/24 baud, online 24 hrs. SysOp: Russell Pencin. PBBS releases. **PRACSA member**

(214)276-8902, **DMUG Computer BBS** -- Garland, TX. 3/12/24 baud, online 24 hrs. SysOp: Unknown. 8/N/1. Multi-level access. Fees for higher access..

(214)357-6446, **Thieve's Underground** -- Dallas, TX. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(214)641-7281, **Radar Room** -- Grand Prairie, TX. 300/1200 baud, online 24 hrs. SysOp: Unknown. Commodore, some MacIntosh.

(214)739-2033, **Alternative London Und** -- Dallas, TX. 300 baud, online 24 hrs. SysOp: Sean Duffy.

(214)742-4247, **Quotron BBS** -- Dallas, TX. 300/1200 baud, online 24 hrs. SysOp: Don Powell.

(214)758-4215, **Darkened Lantern** -- Longview, TX. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(214)987-2135, **Eclectic BBS** -- Dallas, TX. 300/1200 baud, online 24 hrs. SysOp: Charles A Thompson.

(215)356-0860, **N.T.S. PCCS-RCP/M** -- Newton Square, PA. 3/12/24 baud, online 24 hrs. SysOp: Peter M. Essl. Repository for current CP/M & MS-DOS software. **PRACSA member**

(215)623-4040, **Drexel Hill Northstar** -- Drexel Hill, PA. 300/1200 baud, online 24 hrs. SysOp: Robert Dean. Collection point for CP/M software and message exchange related to same. **PRACSA member**

(215)698-1905, **Tele-Master: Satronics** -- Philadelphia, PA. 3/12/24 baud, online 24 hrs. SysOp: Mark Miller.

(215)825-6526, **Philly-Match** -- Phildelphia, PA. unknown baud, online ?? hrs. SysOp: Unknown.

(216)368-3888, **Cleveland Freenet** --

Bulletin Board

Cleveland, OH. 300/1200 baud, online 24 hrs. SysOp: T.M. Grundner. 15 phone lines, 8/N/0 or 7/N/1.
(216)371-3751, **KOMPO BBS** -- Cleveland Heights, OH. 300/1200 baud, online 24 hrs. SysOp: Unknown. For all home computers.
(216)481-9476, **Dial-Your-Match -177** -- Cleveland, OH. 300/1200 baud, online 11pm-8am daily. SysOp: Tom Smith.
(216)524-6494, **AMCOM** -- Cleveland, OH. 300/1200 baud, online 24 hrs. SysOp: Bill Poissant. Amateur Radio, MS-DOS, SysOp conferences, forsales.
(216)729-0625, **The Twin Paradises** -- Cleveland, OH. 300/1200 baud, online 24 hrs. SysOp: Dave Studly. TRS-80 and Atari.
(216)883-6298, **Railnet** --. 300/1200 baud, online 24 hrs. SysOp: Rick Demattia. Railroad hobbyists.
(216)898-1261, **Outer Limits** -- Southington, OH. 1200 baud, online 24 hrs. SysOp: Robert Williams.
(216)929-4803, **CompuCenter BBS** -- Cuyahoga Falls, OH. 300/1200 baud, online 24 hrs. SysOp: Frank J. Hunnell. Commodore computer downloads, BBS lists, E-mail, Public Forum, Amiga, Alternate Reality & other SIGs.
(216)943-2388, **Cleveland Syslink** -- Cleveland, OH. 3/12/24 baud, online 24 hrs. SysOp: Ray Furlong. System communicates at 8 bits/no parity/1 stop bit.
(216)944-1072, **TIBBS-Northcoast 99's** -- Cleveland, OH. 300 baud, online 24 hrs. SysOp: Elmo Iacobucci. TI/99-4A interests.
(217)267-3530, **Starnet** -- Westville, IL. 300/1200 baud, online 24 hrs. SysOp: George Flora.
(217)342-3613, **The Info System** -- Effingham, IL. 300/1200 baud, online 5:30pm--8:30am. SysOp: Lee Kinden.
(217)344-4032, **FOG -14** -- Urbana, IL. 300/1200 baud, online 24 hrs. SysOp: Jonathan Block. **PRACSA member**
(217)356-0044, **Skyline** -- Falls Church, VA. 3000/1200 baud, online 24 hrs. SysOp: Unknown.
(217)356-9102, **Zinl Connection** -- Champaign, IL. 300 baud, online 24 hrs. SysOp: David Murphy.
(217)359-6636, **The Un-Named BBS** -- Champaign, IL. 1200 baud, online 24 hrs. SysOp: Helen Whatley. Requires validation to gain access.
(217)562-2280, **Prairie Data BBS** -- Pana, IL. 300/1200 baud, online ?? hrs. SysOp: Larry Rochkes. System communicates at 8 bits/no parity/1 stop bit.
(217)854-6131, **Sullivans Radio Shack** -- Carlinville, IL. 300/1200 baud, online 8pm-9am. SysOp: Matt Turley. Tandy app..
(217)892-8889, **Network: Atari Express** -- Rantoul, IL. 3/12/24 baud, online 24 hrs. SysOp: Jeffery D. Look. Atari, 35 megabytes of downloads..
(217)893-0579, **Zinl Connection** -- Rantoul, IL. 300 baud, online 24 hrs. SysOp: David Murphy.
(218)728-2128, **Electronic Flagshopper** -- Deluth, MN. 300 baud, online 8am-5pm M-F. SysOp: Bob Martin.
(219)223-8107, **Manitou BBS** -- Rochester, IN. 300 baud, online 6amFri-8amMon. SysOp: Mark Timbers. Downloads for ATARI no passwords.
(219)255-2627, **FORUM FIVE FIDO 11/202** -- Mishawaka, IN. 3/12/24 baud, online 24 hrs. SysOp: Greg Crouch. Sanyo 550/555 support & downloadable files, Fido echomail, Member: National Fido Sanyo Echo Conf..
(219)422-9180, **The Night Gallery** -- Fort Wayne, IN. 300/1200 baud, online 24 hrs. SysOp: Unknown. C-64.
(219)447-2233, **The Warehouse** -- Fort Wayne, IN. 300/1200 baud, online 24 hrs. SysOp: Unknown. C-128 (C-64 mode), 5 fans online.
(219)486-8208, **The Blitzkrieg** -- Ft. Wayne, IN. 3/12/24 baud, online 24 hrs. SysOp: Eric Asberry.
(219)659-1245, **Zyolog ZCBBS** -- Whiting, IN. 3/12/24 baud, online 24 hrs. SysOp: Bob Demeter. XMODEM transfers, 6 online Adventure games, 9 message bases, online computer store.
(301)384-6153, **Mission:Impossible** -- Layhill, MD. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(301)437-4756, **Grizzly's Cave BBS** -- Pasadena, MD. 300/1200 baud, online 24 hrs. SysOp: Rich Sykes. Commodore and other computers supported..
(301)488-7244, **Pizza's Electronics** --. 300/1200 baud, online 24 hrs. SysOp: A. Piccione.
(301)490-5988, **Theater of Pain** -- Layhill, MD. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(301)593-7033, **Handicapped Ed. eXch.** -- Silver Spring, MD. 110/300 baud, online ?? hrs. SysOp: Dick Barth W3HWN. HEX accepts ASCII and Baudot deaf TTY/TDD calls.
(301)597-7502, **SEAT** --. 1200 baud, online ?? hrs. SysOp: David Ginn. Office Automation.
(301)694-0697, **SAS Online** -- Frederick, MD. 300/1200 baud, online ?? hrs. SysOp: Mike Epstein. System communicates at 8 bits/no parity/1 stop bit.
(301)730-5624, **Chusy/BUG BBS** -- Columbia, MD. 3/12/24 baud, online 24 hrs. SysOp: Thomas D. Vervaeke. MS-DOS/Compatibles.
(301)831-5954, **W3JP Exchange** -- Mt Airy, MD. 300/1200 baud, online 24 hrs. SysOp: Lucas Spiros. Xmodem & punter protocol.
(301)884-5420, **The Pirate's Cove** -- Mechanicsville, MD. 300/1200 baud, online 24 hrs. SysOp: Tommy Loeffler. Commodore oriented but all computers welcome..
(301)948-5279, **Shack** -- Rockville, MD. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #21).
(301)985-0216, **Midnight Hour** -- Hyattsville, MD. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(302)322-3999, **TIBBS** -- Newark, DE. unknown baud, online 24 hrs. SysOp: Unknown. Delaware Valley Users Group (DVUG) (TI Home Computers).
(302)337-3511, **Baudville BBS** -- Bridgeville, DE. 300/1200 baud, online 24 hrs. SysOp: Unknown. Mainly Atari support.
(302)674-1449, Wilmington, DE. unknown baud, online 6:00pm-6:00am. SysOp: Unknown. Delaware Valley Users Group (DVUG) (TI home computers).
(303)226-8795, **USS Liberty Vet Assoc.** -- Denver, CO. unknown baud, online ?? hrs. SysOp: Unknown. U.S.S. Liberty Veterans Association BBS.
(303)320-4822, **World Peace RCP/M** -- Denver, CO. 3/12/24 baud, online 24 hrs. SysOp: Alfred K. Carr. Communications, theology, world peace issues. **PRACSA member**
(303)447-2200, **The Mountain View BBS** -- Boulder, CO. 300/1200 baud,

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West. Digital RLL/cables	$115
DTC 5150CX/cables	$73

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Seagate ST225 20MB (65 ms)	$250
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online 24 hrs. SysOp: David Westphalen.

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(303)632-0669, **The Computer Farm BBS** -- Colorado Springs, CO. 3/12/24 baud, online 24 hrs. SysOp: Paul D. Hill. Free to the public.

(303)973-0369, **Atlantis BBS** -- Littleton, CO. 3/12/24 baud, online 24 hrs. SysOp: Unknown. Apple and Mac Software.

(304)525-2031, **HUG** -- Huntington, WV. 1200 baud, online 24 hrs. SysOp: Unknown. IBM & compatibles.

(304)636-9097, **BBS-PC WV** -- Elkins, WV. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(304)744-2253, **Pirate-80** -- Charleston, WV. 300/1200 baud, online 24 hrs. SysOp: Steve Goodman.

(305)233-4783, Miami, FL. 300 baud, online 12 Sat.-12 Sun. SysOp: Unknown.

(305)255-6307, **MUG** -- Miami, FL. 300/1200 baud, online 24 hrs. SysOp: Burt Schreiber.

(305)268-3690, **Alien UFO BBS** -- Titusville, FL. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(305)294-1060, **GABBY** -- Key West, FL. 300/1200 baud, online 7PM-7AM 24 W/E. SysOp: Jim Carey.

(305)348-5295, **Atari Express** -- Kissimmee, FL. 300/1200 baud, online 24 hrs. SysOp: Larry A. Charpiat. Supports ASCII/ATASCII.

(305)395-6906, **Digital Logic's BBS** -- Deerfield Beach, FL. unknown baud, online ?? hrs. SysOp: Unknown.

(305)429-9962, **Umbilical AE** -- Dearfield Beach, FL. unknown baud, online ?? hrs. SysOp: Unknown.

(305)434-4927, **The Rainforest** -- Cooper City, FL. 3/12/24 baud, online 24 hrs. SysOp: Steve Schneider.

(305)439-2136, **The Fortune Cookie BBS** -- Lake Worth, FL. 3/12/24 baud, online 12p-8p 24 S-S. SysOp: Blake Levy. IBM.

(305)453-0079, **Nova BBS** -- Merritt Island, FL. 300/1200 baud, online 24 hrs. SysOp: Ted Grachis.

(305)594-4526, **Adults Only Mansion** -- Miami, FL. 300 baud, online 24 hrs. SysOp: Theodore J. Glass.

(305)631-6844, **Chatterbox** -- Rockledge, FL. 300/1200 baud, online 24 hrs. SysOp: Unknown. Message areas on music, advice, computers.

(305)633-0636, **NORAD** --. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(305)676-3873, **Chicken Ranch** -- Palm Bay, FL. 300/1200 baud, online 24 hrs. SysOp: Vicki Napier. General purpose board with online games.

(305)689-1085, **Adamtalk** -- West Palm Beach, FL. 300 baud, online 6pm-1am. SysOp: Unknown. full duplex,8/N. A-line feed only.

(305)699-5315, **QRC** -- Winter Springs, FL. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(305)722-1311, **The Gateway RBBS** -- Ft. Lauderdale, FL. 300/1200 baud, online 24 hrs Mon-Sat. SysOp: Dave Cohen. PD downloads, Business advertisement section, color menus. 8/N/1.

(305)734-6026, **Atari CC of Palm Beach** -- Palm Beach, FL. 300 baud, online 24 hrs. SysOp: Unknown. ATASCII only -- Atari Computer Club of the Palm Beaches.

(305)777-5555, **HOT** -- Titusville, FL. unknown baud, online ?? hrs. SysOp: Unknown.

(305)777-8802, **Startrek** -- Satellite Beach, FL. 300/1200 baud, online 24 hrs. SysOp: Fred Maywald. Interactive Gaming.

(305)847-2056, **Atari Party-Line** -- Kissimmee, FL.. 300/1200 baud, online 24 hrs. SysOp: Tony Stipich. Atari Files U/D.

(306)949-1564, **Onyx RCP/M** -- Regina, Sask. 300/1200 baud, online 24 hrs. SysOp: Cris Ball. FOG Remote System #50. **PRACSA member**

(309)342-5486, **E.G.A.D.S!** -- Galesburg, IL. 300/1200 baud, online 24 hrs. SysOp: Tim Brown.

(312)235-7902, **CFOG -2** -- Chicago, IL. 3/12/24 baud, online 24 hrs. SysOp: Bill Kuykendall. Chicago FOG (FOG AMO #80) member supported system. **PRACSA member**

(312)252-2136, **Logan Square** -- Chicago, IL. unknown baud, online ?? hrs. SysOp: Earl Bockenfeld.

(312)326-4392, **CPM3 RCP/M** -- Chicago, IL. 300/1200 baud, online 24 hrs. SysOp: Dick Lieber.

(312)343-0100, **Lincolnet** -- Maywood, IL. unknown baud, online ?? hrs. SysOp: Patrick R. Dewey.

(312)356-6897, **Nessy-2 Game System** -- Lake Villa, IL. 300 baud, online 24 hrs. SysOp: Paul Berker. Games.

(312)359-8080, **Palatine RCP/M** -- Palatine, IL. 300/1200 baud, online 24 hrs. SysOp: Tim Cannon.

(312)384-0013, **Xerox Midwest** -- Chicago, IL. 300/1200 baud, online 24 hrs. SysOp: David Lowy.

(312)384-2320, **CACHE Lobo-80** -- Chicago, IL. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(312)395-0991, **The Night Train BBS** -- Antioch, IL. 300/1200 baud, online 24 hrs. SysOp: Gary Burnette.

(312)420-1722, **DigiTec Znode (tm)** -- Lisle, IL. 3/12/24 baud, online 24 hrs. SysOp: Unknown.

(312)447-8175, **Riverside Premium BBS** -- Riverside, IL. 3/12/24 baud, online 24 hrs. SysOp: Don Marquardt. Online registration, open to all.

(312)528-5020, **Ripco International** -- Chicago, IL. 1200/2400 baud, online 24 hrs. SysOp: Dr. Ripco.

(312)545-8086, **CBBS -1** -- Chicago, IL. 3/12/24 baud, online 24 hrs. SysOp: Unknown.

(312)622-4442, **Chicago Syslink** -- Chicago, IL. 300/1200 baud, online ?? hrs. SysOp: George Matyaszek. System communicates at 8 bits/No parity/1 stop bit.

(312)649-1730, **Z-System Znode (tm)** -- Chicago, IL. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(312)674-1638, **Bill's BBS** -- Lincolnwood, IL. unknown baud, online 3p-12a M-F. SysOp: Bill Knopp. Online registration, open to all.

(312)690-3808, **Ampro 4 RCP/M** -- Chicago, IL. 3/12/24 baud, online 24 hrs. SysOp: Jim Mills.

(312)729-0556, **Ham Radio BBS** -- Chicago, IL. 300 baud, online ?? hrs. SysOp: Unknown.

(312)729-2101, **IBMPC/Business BBS** -- Chicago, IL. 300/1200 baud, online 24 hrs. SysOp: Les Multack.

(312)772-2452, **Orgasm!** -- Chicago, IL. 300/1200 baud, online 24 hrs. SysOp: Bruce Barnes.

(312)789-3966, **Oracomm -11** -- Clarendon Hills, IL. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(312)848-3669, **Apple SIG** -- Chicago, IL. 300 baud, online 24 hrs. SysOp: Larry McMahon.

(312)849-1132, **Dolton CBBS** -- Chicago, IL. 3/12/24 baud, online 24 hrs. SysOp: Ward Christensen.

(312)879-2751, **Steward's Ship** -- Batavia, IL. 300/1200 baud, online 24 hrs. SysOp: Sam Cook. Christian, All computers.

(312)897-6532, **Computer Solutions** -- Aurora, IL. 300/1200 baud, online 24 hrs. SysOp: Bill Slaker.

(312)922-3626, **XNX (Exchange-News-Ex)** -- Chicago, IL. 300/1200 baud, online 24 hrs. SysOp: Bill F. Eng. Multi-user financial info board for stock and future traders. IBM 80 character screen supported.

(312)983-5147, **Sun Valley RCP/M** -- Lisle, IL. 3/12/24 baud, online 24 hrs. SysOp: K Stritzel.

(313)268-8706, **Unmentionables** -- Sterling Heights, MI. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(313)274-3206, **Highway 61** -- Dearborn Heights, MI. 300/1200 baud, online 24 hrs. SysOp: Mark Gross. All computers welcome.

(313)286-0145, **Serial Port** -- Dearborn, MI. 3/12/24 baud, online 24 hrs. SysOp: Stu Jackson.

(313)443-0365, **DeFOG's RBBS-RCP/M** -- Detroit, MI. 300/1200 baud, online 24 hrs. SysOp: Bill Rice. FOG Remote System #26 -- Detroit FOG (FOG AMO #14) member supported system. **PRACSA member**

(313)459-8375, **Good News BBS** -- Dearborn, MI. 3/12/24 baud, online 24 hrs. SysOp: Unknown.

(313)538-6968, **The PX Dock** -- Detroit, MI. 300/1200 baud, online 24 hrs. SysOp: Bob Hermann. PX-8 files and programs only.

(313)645-1704, **The Schoolhouse** -- Birmingham, MI. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(313)736-3920, **Facts BBS** -- Flint, MI. 300/1200 baud, online 24 hrs. SysOp: Jerry Cross. Supports Atari and other computers..

(313)761-2444, **Clear Thinking BBS** -- Ann Arbor, MI. 300/1200 baud, online 24 hrs. SysOp: Craig Harvey. Atari, Modula-2, Fantasy.

(313)852-5534, **Proteus 7** -- Bloomfield Hills, MI. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #22).

(313)881-7998, **Lakeside Data Station** -- Dearborn, MI. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(313)933-1425, **Detroit Download** -- Dearborn, MI. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(313)949-6745, **Microchip BBS** -- Mt. Clemens, MI. 3/12/24 baud, online 24 hrs. SysOp: Dave Marker. Downloads for ALL computers!.

(314)472-1919, **Debug Express** -- Sikeston, MO. 300/1200 baud, online 6pm-9pm. SysOp: Unknown.

(314)868-3108, **Gateway CP/M BBS** -- St. Louis, MO. 300/1200 baud, online 24 hrs. SysOp: Bill Schulte. Sponsored by Gateway CP/M Users Group. Message board, public domain software.

(314)878-8573, **The Castle** -- St. Louis, MO. 300/1200 baud, online 24 hrs. SysOp: James Neal.

(315)437-5857, **Genesis/MIDI Users BBS** --. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(315)622-1952, **The Atarian Connection** -- Syracuse, NY. unknown baud, online ?? hrs. SysOp: Dave Webster.

(317)251-3278, **Software, Etc. . . -1** -- Indianapolis, IN. 300/1200 baud, online 24 hrs. SysOp: Unknown. Online ordering of computer books and software are promoted..

(317)452-1535, **Bible Bulletin Board** -- Galveston, IN. 3/12/24 baud, online 24 hrs. SysOp: Tony Capoccia.

(317)576-0261, **Software, Etc Exchange** -- Indianapolis, IN. 300/1200 baud, online 24 hrs. SysOp: Unknown. Online ordering of computer books and software are promoted..

(317)631-9942, **Hoosier Users Group** -- Indianapolis, IN. 300 baud, online 24 hrs. SysOp: Steve Simms. Dedicated to users of Texas Instruments 99/4A computers.

(317)842-2208, **IBM PC Users Group Inc** -- Indianapolis, IN. 3/12/24 baud, online ?? hrs. SysOp: Unknown.

(318)636-4402, **Soft Fido** -- Schreveport, LA. 300/1200 baud, online ?? hrs. SysOp: Daniel Tobias. Supports IBM, C-64, Apple. 14 different message topics, downloads, online games with scoreboard.

(318)837-4971, **The House of Horrors** --. 300 baud, online ?? hrs. SysOp: Marc Hebert.

(319)326-3904, **FOG -25** -- Davenport, IA. 300/1200 baud, online 24 hrs. SysOp: Matthew Reed. Quad City Osborne Group (FOG AMO #102) member supported system. **PRACSA member**

(401)272-1138, **Syslink (HQ)** -- Providence, RI. 300/1200 baud, online ?? hrs. SysOp: Don Lambert. System communicates at 8 bits/No parity/1 stop bit.

(401)364-9788, **The South Shore BBS** -- Carolina, RI. 300/1200 baud, online 24 hrs. SysOp: Unknown.

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(403)486-0179, **Dial-Your-Match** -- Edmonton, ALTA. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #32).

(404)354-0662, **FOG -27** -- Athens, GA. 300/1200 baud, online 24 hrs. SysOp: Bob Herrin. Computer User Group of Athens (FOG AMO #81) member supported system. **PRACSA member**

(404)546-0679, **/Channel 33!Atari!BBS** -- Athens, GA. 300 baud, online 24 hrs. SysOp: Ric Helton. Atari.

(404)883-7038, **Computer Corner** -- LaGrange, GA. unknown baud, online 6pm-10am. SysOp: Unknown. Computer Corner Information Service.

(404)922-8483, **Playhouse** -- Conyers, GA. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #30).

(404)928-9311, **Advertise Atlanta! BBS** -- Atlanta, GA. 300/1200 baud, online 24 hrs. SysOp: Terry Harris. Want Ads, etc..

(404)962-8687, **Shade Tree** -- Lawrenceville, GA. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #20).

(404)997-6238, **The Index System** -- Atlanta, GA. 3/12/24 baud, online 24 hrs. SysOp: Aloia, Rodney A.

(405)233-3022, **Terry Family Genealogy** -- Enid, OK. 300/1200 baud, online 9pm-12am M-F. SysOp: Unknown.

(405)692-1061, **Tinker Atari Comp Enth** -- Oklahoma City, OK. 300/1200 baud, online 24 hrs. SysOp: Michael E. Beard. Atari oriented.

(405)733-3102, **MidWest MIDI BBS** -- Oklahoma City, OK. 1200 baud, online 24 hrs. SysOp: John Fordenbacher. IBM System supporting all computers.

(405)848-5317, **Constitutional Pathway** -- Oklahoma City, OK. 300/1200 baud, online 24 hrs. SysOp: Whitney Boutin. FOG Remote System #13 -- Oklahoma CP/M Users' Group (FOG AMO #67) member supported system. **PRACSA member**

(408)238-9621, **SERVU** -- San Jose, CA. 3/12/24 baud, online 24 hrs. SysOp: Al Mehr. CP/M80, CP/M86, Macintosh, PC-DOS, MS-DOS software. **PRACSA member**

(408)245-1420, **ZEE Machine** -- Sunnyvale, CA. 3/12/24 baud, online 24 hrs. SysOp: Norman L. Beeler. Public Domain Software. **PRACSA member**

(408)246-9936, **Teddy Bear Retreat** -- Santa Clara, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #35).

(408)253-1309, **Digikron Systems** -- San Jose, CA. 3/12/24 baud, online 24 hrs. SysOp: Douglas Thom. ZCPR3 & Apple CP/M & Macintosh. **PRACSA member**

(408)262-3208, **DC to Light** -- San Jose, CA. 300/1200 baud, online 24 hrs. SysOp: Fred Townsend. Heath/Zenith software, general interest. **PRACSA member**

(408)262-5150, **DC to Light** -- San Jose, CA. 300/1200 baud, online 24 hrs. SysOp: Fred Townsend. Heath/Zenith software, general interest. **PRACSA member**

(408)262-7177, **SpaceNET** -- Milpitas, CA. 300/1200 baud, online 24 hrs. SysOp: Bill Dale. Space Frontier SIG. **PRACSA member**

(408)354-5934, **Saratoga PBBS** -- Saratoga, CA. 300/1200 baud, online 24 hrs. SysOp: Chuck Metz. Public domain software and technical information exchange. **PRACSA member**

(408)385-1141, **Black Mountain II** -- Salinas Valley, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. Games, nationwide BBS listings, X-rated and RAG board sections, supports all computers.

(408)720-9212, **Bizcomp BBS** -- Sunnyvale, CA. 300/1200 baud, online 24 hrs. SysOp: Howard Stateman. Modem technical support. **PRACSA member**

(408)733-4670, **B.A.S.I.S. BBS** -- Sunnyvale, CA. 3/12/24 baud, online 24 hrs. SysOp: Clay Walker. User group members and invited guests. **PRACSA member**

(408)778-3531, **The SDI Clearinghouse** -- Morgan Hill, CA. 300/1200 baud, online 24 hrs. SysOp: Chris Winter. Source of information on space exploration and development. **PRACSA member**

(408)866-8959, **MicroResearch Rem Sys** -- Campbell, CA. 300/1200 baud, online 24 hrs. SysOp: Mitchell Orysh. Software exchange. **PRACSA member**

(408)867-6575, **Eigenware (tm)** -- Saratoga, CA. 300/1200 baud, online 24 hrs. SysOp: Karl L. Remmler. BBS & Database for programmers. **PRACSA member**

(408)947-8038, **Wild Bill's** -- San Jose, CA. 300/1200 baud, online 24 hrs. SysOp: Bill Strouse. Trail Information Volunteer Center (TIVC) listing bicycle, jogging, and horse activities. **PRACSA member**

(408)972-9750, **DynamicResources & You** -- San Jose, CA. 300/1200 baud, online 24 hrs. SysOp: Terry Woolsey. **PRACSA member**

(409)848-0187, **Doctors' BBS** -- Angleton, TX. 300 baud, online 12noon-8pm Sat. SysOp: Norman Richards. supports Commodore.

(412)276-1269, **UCS-1** -- Pittsburgh, PA. 300/1200 baud, online 24 hrs. SysOp: C Fricaro.

(412)276-3374, **UCS-2** -- Pittsburgh, PA. 1200 baud, online 24 hrs. SysOp: C Fricaro.

(412)364-6452, **PD Warehouse BBS** -- Pittsburgh, PA. 300/1200 baud, online ?? hrs. SysOp: John D. Penberthy. 8/N/1.

(412)366-3378, **China Blue** -- Pittsburgh, PA. 300-1200 baud, online ?? hrs. SysOp: John D. Penberthy. 8/N/1.

(412)463-1347, **Cave Man BBS** -- Indiana, PA. 3/12/24 baud, online 24 hrs. SysOp: Bruce Mittleman. Spelunker's conference.

(412)531-0137, **Amiga Avenue!** -- Pittsburgh, PA. 300/1200 baud, online M-W-F 24 hrs. SysOp: Susan & Ron Molnar.

(412)832-7462, **Unique BBS** -- Greensberg, PA. 300 baud, online 24 hrs. SysOp: Douglas Booher.

(413)569-0550, **Cul-De-Sac Bar & Grill** -- Southwick, MA. 3/12/24 baud, online 24 hrs. SysOp: Dean Leclerc. Commodore, others, Amateur Radio & humor.

(414)383-9692, **TAM/Milwaukie *Main*** -- Milwaukee, MI. 300 baud, online 6pm - 12 noon. SysOp: K. R. Tarr. Features: Electronic Mail, Questionnaire, BBS listing, etc. File transer soon for major computers.

(414)633-2285, **Modem-Vaders** -- Racine, WI. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(414)633-3094, **River Bottom Boys** -- Racine, WI. 300/1200 baud, online 24 hrs. SysOp: Don Wade. Uploads & downloads for most computers.

(414)781-5710, **Milatari BBS** -- Milwaukee, WI. 300/1200 baud, online 24 hrs. SysOp: Richard Dankert. Atari oriented.

(414)964-5160, **Exec-PC BBS** -- Shorewood, WI. 3/12/24 baud, online ?? hrs. SysOp: Unknown.

(415)222-2858, **Alpha Centari** -- El Sobrante, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(415)223-2237, **BAKUP RBBS** -- Oakland, CA. unknown baud, online 24 hrs. SysOp: Ken Fowler.

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Bulletin Board

(415)285-2687, **KAY*FOG** -- San Francisco, CA. 300/1200 baud, online 24 hrs. SysOp: Bond Shands. Novices and subject (dBASE, WordStar, MEX, etc) conferences -- mail registration required. **PRACSA member**

(415)285-2970, **The Billboard BBS** -- San Francisco, CA. 300/1200 baud, online 7-10PM. SysOp: Steven Inmon.

(415)323-4579, **SMOG3 (FOG 40)** -- Menlo Park, CA. 3/12/24 baud, online 24 hrs. SysOp: Philip A. Moore. SMOG3 (FOG AMO #68) member supported system. **PRACSA member**

(415)364-3739, **Anatomically Correct** -- Atherton, CA. 300/1200 baud, online 24 hrs. SysOp: Howard Stateman. Adult interests. **PRACSA member**

(415)365-2650, **Emerald Lake (FOG 48)** -- Redwood City, CA. 3/12/24 baud, online 24 hrs. SysOp: Dick Worth. **PRACSA member**

(415)383-0473, **Marin RBBS** -- Mill Valley, CA. 300 - 710 baud, online 5p-8a (S/S 24). SysOp: Jim Ayers. CP/M and Otrona Attache. **PRACSA member**

(415)489-9005, **ZCPR3 BBS/Z-Node Centr** -- Fremont, CA. 3/12/24 baud, online 24 hrs. SysOp: David McCord. Source of ZCPR3 software & support. **PRACSA member**

(415)552-8648, **PCCUG BBS** -- Corte Madera, CA. 3/12/24 baud, online 24 hrs. SysOp: Roy Levin.

(415)572-8219, **Kay*Fun** -- San Mateo, CA. 300/1200 baud, online 24 hrs. SysOp: Ernest Hintz. CP/M software and messages. System supported by Kayfun members. **PRACSA member**

(415)591-6259, **FOG - 4** -- Belmont, CA. 3/12/24 baud, online 24 hrs. SysOp: Roy Robinson. CP/M & MS-DOS support. **PRACSA member**

(415)595-5079, **TechNet** -- San Carlos, CA. 3/12/24 baud, online 24 hrs. SysOp: Eric R. Daniel. MS-/PC-DOS software, communications, engineering, AutoCAD & ham radio SIGs. **PRACSA member**

(415)655-1206, **FOG -33** -- Oakland, CA. 300/1200 baud, online 24 hrs. SysOp: Kenji Nakadegawa. East Bay FOG (FOG AMO #3) member supported system. **PRACSA member**

(415)692-1861, **WestWind BBS** -- Millbrae, CA. 300/1200 baud, online 24 hrs. SysOp: Yati Sahae. Support of WestWind customers. **PRACSA member**

(415)755-2030, **FOG - 1** -- Daly City, CA. 3/12/24 baud, online 24 hrs. SysOp: Gale Rhoades. Distribution of FOG Disk Library. FOG or PRACSA membership required for access to download area. **PRACSA member**

(415)755-8315, **FOG - 6** -- Daly City, CA. 3/12/24 baud, online 24 hrs. SysOp: Jack Brown. Technical information and FOG uploads -- open to the public. **PRACSA member**

(415)792-3481, **FOG -38** -- Newark, CA. 3/12/24 baud, online 24 hrs. SysOp: Gerald Wright. **PRACSA member**

(415)845-2164, **Berkeley Mega-Monster** -- Berkeley, CA. 3/12/24 baud, online 24 hrs. SysOp: Tony Adams. CP/M and MS-DOS public domain software. **PRACSA member**

(415)851-7732, **King's Mountain** -- Woodside, CA. 300/1200 baud, online 24 hrs. SysOp: Troy Soult. FOG #12 -- mainly MS-DOS software. **PRACSA member**

(415)856-2771, **The Desktop Publisher** -- Palo Alto, CA. 3/12/24 baud, online 24 hrs. SysOp: Freeman Bradford. Hobby. **PRACSA member**

(415)927-1216, **MSPCUG BBS** --. 3/12/24 baud, online 24 hrs. SysOp: Howard Leistner.

(415)938-9470, **Co-Ed Associates** -- Walnut Creek, CA. 3/12/24 baud, online 24 hrs. SysOp: Werner L. Gumpert. Software exchange. **PRACSA member**

(415)939-1246, **CLUB 100** -- Pleasant Hill, CA. 300/1200 baud, online 24 hrs. SysOp: Richard Hanson. World's largest membership system dedicated to Radio Shack Model 100, 102, 200..

(415)948-2513, **PRACSA** -- Los Altos Hills, CA. 300/1200 baud, online 24 hrs. SysOp: Irv Hoff. PRACSA-member only system. **PRACSA member**

(415)949-1072, Los Altos, CA. unknown baud, online 24 hrs. SysOp: Kevin Murphy.

(415)965-4097, **Mt. View RCP/M** -- Mountain View, CA. 300/1200 baud, online 24 hrs. SysOp: Byron McKay. BBS open to the public. CP/M 80, 86, and 68K emphasis. **PRACSA member**

(415)966-5319, **The Office** -- Moffett Field, CA. 300/1200 baud, online 4pm-7:30am M-F. SysOp: John Allen. Pass information to new computers in the Navy. **PRACSA member**

(415)968-7369, **SIGSIG BBS (FOG -31)** -- Mt. View, CA. 3/12/24 baud, online 24 hrs. SysOp: Jim Switz. FOG support. **PRACSA member**

(415)989-8299, **Generic FIDO BBS** -- San Francisco, CA. unknown baud, online ?? hrs. SysOp: Tom Orman.

(416)431-0114, **Spiderweb Syslink** -- Scarborough, ONT. 300/1200 baud, online ?? hrs. SysOp: George Grimm. System communicates at 8 bits/no parity/1 stop bit.

(417)887-4969, **The Auctioneer BBS** -- Springfield, MO. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(419)242-1694, **The Hamshack** -- Toledo, OH. 300/1200 baud, online 24 hrs. SysOp: Tom Lewcndowski.

(419)877-5556, **Colorama** -- Whitchouse, OH. 300 baud, online 24 hrs. SysOp: John Kendziora.

(501)224-9454, **ROSBBS LR** -- Little Rock, AR. 300/1200 baud, online 24 hrs. SysOp: Rick Mobley. CP/M-MS/DOS.

(501)338-7857, **PCCC-HWUCBBS** -- West Helena, AR. 300 baud, online 24 hrs. SysOp: Unknown.

(501)374-8468, **The Ferrett Face BBS** -- North Little Rock, AR. 300/1200 baud, online 24 hrs. SysOp: Dave Dennett. XMODEM & PUNTER Protocols for C-64/128 program exchange. Color/Graphics or ASCII.

(501)442-2660, **Ralph's PC** -- Fayetteville, AR. 300/1200 baud, online 24 hrs. SysOp: Ralph Mader.

(501)745-2362, **99 Hillbillies Holler** -- Botkinburg, AR. 3/12/24 baud, online 24 hrs. SysOp: Fred DuVall.

(502)241-4109, **Soft Stone** -- Louisville, KY. 300/1200 baud, online 24 hrs. SysOp: Curt Edwards. FOG Remote System #24. **PRACSA member**

(502)439-6968, **Savage** -- Fort Campbell, KY. 300 baud, online 24 hrs. SysOp: Unknown.

(502)542-7226, **PCKY** -- Buffalo, NY. 300/1200 baud, online 24 hrs. SysOp: Steve. All computer welcome.

(502)885-2521, **Circadian** -- Hopkinsville, KY. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(502)885-5429, **Hacknet America** -- Hopkinsville, KY. 300/1200 baud, online 7pm-7am. SysOp: Beowulf.

(503)370-7655, **The Time Talker** -- Salem, OR. 1200/2400 baud, online 24 hrs. SysOp: Ken Jones. Znode #4 to further 8-bit machines. **PRACSA member**

(503)581-6409, **SACC PDSE** -- Salem, OR. 3/12/24 baud, online 24 hrs. SysOp: Ken Jones. Public domain software exchange of the Salem Area Computer Club. **PRACSA member**

(504)241-5673, **The SchoolHouse BBS** -- New Orleans, LA. 300/1200 baud, online 24 hrs. SysOp: Emile Gardette. Atari.

(504)295-1823, **The Microsystems BBS** -- Baton Rouge, LA. 1200/2400 baud, online 24 hrs. SysOp: Keith Thibodeaux. Multi Interest, IBM.

(504)340-8172, **TI-Net -4** -- Marrero, LA. 3/12/24 baud, online 24 hrs. SysOp: Paul Arnold. Support for TI-99 and other computers.

(504)649-3872, **A.P.E.S.** -- Slidell, LA. 3/12/24 baud, online 24 hrs. SysOp: Phil Catarella.

(504)738-3600, **NOAUG BBS** -- New Orleans, LA. unknown baud, online ?? hrs. SysOp: Ken Livaudais. Sponsored by New Orleans Atari Users Group.

(504)851-0362, **HYPERSPACE** -- Houma, LA. unknown baud, online ?? hrs. SysOp: Unknown.

(504)851-4857, **The Curtain Call B. B.** -- Houma, LA. 300/1200 baud, online 24 hrs. SysOp: Tim Burcham. 8/N/1.

(505)392-2447, **Midnight Thinking BBS** -- Hobbs, NM. 3/12/24 baud, online 24 hrs. SysOp: Bill Porter. Online discount mail order. Apple, Atari, Commodore, IBM sub-boards, games, downloads, airline sched.

(505)437-2280, **FAST-KODE ROS -28** -- Alamogordo, NM. 3/12/24 baud, online 24 hrs. SysOp: John P. Nicholson. Tourist Info/Local Attractions,CP/M,MS-DOS,Kaypro,Tandy,Apple,Mac,CoCo,dBase,Pascal,ROS,Amiga,&more.

(507)289-8211, **Whisper Line** -- Rochester, MN. 300 baud, online ?? hrs. SysOp: Unknown. Whisper Reader/LEX-31.

(507)289-8452, **Fido: Rams** -- Rochester, MN. 3/12/24 baud, online ?? hrs. SysOp: Unknown.

(507)931-5879, **Xanadu BBS** -- St. Peter, MN. 300 baud, online 24 hrs. SysOp: Mike Ulik. Love Connection, Used Equiptment, Messages, News.

(509)582-8118, Pasco, WA. 300/1200 baud, online 24 hrs. SysOp: Dennis Arter. Proffesional Exchange.

(509)624-7371, **SMUG** -- Spokane, WA. unknown baud, online 24 hrs. SysOp: Jeff Albrecht. CP/M.

(509)697-6070, **The Apple Board** -- Selah, WA. 300/1200 baud, online 24 hrs. SysOp: Kevin Nold. Online games.

(512)592-1214, **The Trade-80 BBS** -- Kingsville, TX. 300 baud, online 24 hrs. SysOp: Bruce Claunch.

(512)687-1221, **Alpha-Flight** --. unknown baud, online ?? hrs. SysOp: Unknown.

(512)688-3129, **The 64th Parallel** -- San Antonio, TX. 300/1200 baud, online 24 hrs. SysOp: Joe H. Wilson. Supporting Commodore 64/128, CP/M, Geos. networking available..

(513)229-2673, **U.D. RMP/M-RBBS** --. 1200 baud, online 24 hrs. SysOp: Unknown.

(513)229-2674, **U.D. RMP/M-RBBS** --. 300 baud, online 24 hrs. SysOp: Unknown.

(513)236-1360, **Ringworld** --. unknown baud, online 24 hrs. SysOp: Unknown.

(513)236-6051, **Multi-Op** --. 300 baud, online 24 hrs. SysOp: Unknown.

(513)258-1426, **PMUG BBS** --. unknown baud, online ?? hrs. SysOp: Unknown.

(513)293-1754, **DMA RBBS** -- Dayton, OH. unknown baud, online 24 hrs. SysOp: Unknown. For use by current/prospective Dayton Microcomputer Association members.

(513)294-2479, **KGB** --. unknown baud, online 24 hrs. SysOp: Unknown. Fee for system access.

(513)298-6736, **Atari Interconnexion** --. unknown baud, online 24 hrs. SysOp: Unknown. Fee for system access.

(513)299-3665, **Webbed Sphere** --. 300/1200 baud, online 24 hrs. SysOp: Unknown. Fee for system access.

(513)367-6842, **Proto-Call BBS** -- Cincinnati, OH. 300/1200 baud, online 24 hrs. SysOp: Unknown. Cin'Tara (Cincinnati Atari Users Group).

(513)372-3373, **Xenet Telecom BBS** -- Xenia, OH. 300/1200 baud, online 24 hrs. SysOp: Raymond Moore.

(513)429-2232, **Apple Dayton ABBS** -- Dayton, OH. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(513)429-2589, **Circuit Board** --. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(513)433-3232, **Underground BBS** --. unknown baud, online 3pm-7am. SysOp: Unknown. Fee for system access.

(513)433-6815, **Al's New&Used Computer** --. 300/1200 baud, online 8:00pm-8:00am. SysOp: Unknown. MS-DOS and E-mail.

(513)434-6101, **NET** --. 3/12/24 baud, online 24 hrs. SysOp: Unknown.

(513)434-8261, **Relm of Asmodeus IV** --. unknown baud, online 24 hrs. SysOp: Unknown.

(513)435-8381, **Mac Exchange** --. 300/1200 baud, online 24 hrs. SysOp: Unknown. For MacIntosh users.

(513)455-3602, **EDS BBS** --. unknown baud, online 24 hrs. SysOp: Unknown.

(513)481-1417, **COG RCP/M** -- Cincinnati, OH. 3/12/24 baud, online 24 hrs. SysOp: Brian Rau. Cincinnati Osborne Group (FOG A.M.O. #27) member supported system.

(513)548-0470, **Nerd's BBS** -- Greenville, OH. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(513)687-3600, **Heavensoft** --. unknown baud, online ?? hrs. SysOp: Unknown. For MS-DOS users.

(513)787-3777, **The Imagination BBS** -- Camden, OH. 3/12/24 baud, online 24 hrs. SysOp: James Redd. Atari 8-bit & ST, C-64 & Amiga, IBM, Apple, CP/M and others. Uploads/downloads.

(513)832-1974, **Enterprise** --. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(513)832-2244, **Host RCP/M** --. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(513)836-2741, **Daycug Board** --. unknown baud, online ?? hrs. SysOp: Unknown. Coco, fee for system access.

(513)845-1022, **Commodore Mainframe** --. unknown baud, online 24 hrs. SysOp: Unknown.

(513)849-0179, **Commodore Connection** -- Medway, OH. 300/1200 baud, online 24 hrs. SysOp: Brian Klingle.

(513)849-6311, **DX BBS** --. unknown baud, online 24 hrs. SysOp: Unknown. Fee for system access.

(513)854-5924, **Jabber BBS** --. unknown baud, online ?? hrs. SysOp: Unknown. Fee for access.

(513)878-7263, **Sandbox** --. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(513)897-4881, **Laser Quest** --. unknown baud, online ?? hrs. SysOp: Unknown.

(513)898-0702, **AmigaBoard** --. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(514)487-2792, **Micro-Dial** -- Montreal, Canada. 300/1200 baud, online 24 hrs. SysOp: Leonard L. 8/N/1, Supports all computer systems, 18 message bases, games, E-mail, 1st time callers: enter. ,

(514)645-8055, **Datamate** -- Montreal East, P.Q.. 300/1200 baud, online 24 hrs. SysOp: Mark Prince. First time callers enter NEW to register or 200 PASSWORD for public access. 8/N/1.

(514)684-4922, **Ozzie's FIDO (FOG -47)** -- Roxboro, Quebec. 3/12/24 baud, online 24 hrs. SysOp: Rene Champagne. **PRACSA member**

(515)263-0796, **TIBBS** -- Ames, IA. 300 baud, online ?? hrs. SysOp: Unknown.

(515)673-3763, **Skunk River Bullit** -- Oskaloosa, IA. 3/12/24 baud, online 24 hrs. SysOp: Tom Larse.

(515)964-5353, **FOG-Line BBS** -- Ames, IA. 300/1200 baud, online 10:30pm-7:00am. SysOp: Dan Buda.

(516)286-7842, **Nyconn BBS** -- East Patchouge, NY. 3/12/24 baud, online 24 hrs. SysOp: Ronald Beausoleil. PC/XT/AT Programs, Readmac, Graphics, Games.

(516)289-0367, **Tele-Master: HQ** -- Patchogue, NY. 3/12/24 baud, online 24 hrs. SysOp: Trace Microsystems.

(516)374-5071, **Dragon's Lair** -- Hewlett, NY. unknown baud, online 24 hrs. SysOp: Unknown.

(516)475-3480, **TI Source (tm)** -- Patchogue, NY. 300/1200 baud, online 24 hrs. SysOp: Steve Lamberti. Supports TI-99/4A, Myarc 9640 computer.

(516)475-6463, **TITEX** -- Hicksville, NY. unknown baud, online ?? hrs. SysOp: Unknown.

(516)486-4705, **The Unknown RBBS** -- South Hempstead, NY. 3/12/24 baud, online 24 hrs. SysOp: David Johnson. AT&T PC6300 help, all compatibles welcome.

(516)561-6590, **LICA BBS** -- Long Island, NY. unknown baud, online 24 hrs. SysOp: Unknown.

(516)665-1851, **Jockey Club East** -- Holbrook, NY. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #29) multi-user.

(516)681-2232, **USS Liberty Vet. Assc.** -- Hicksville, NY. unknown baud, online ?? hrs. SysOp: Unknown. U.S.S. Liberty Veterans Association BBS.

(516)754-0575, **PC Review** --. 1200 baud, online ?? hrs. SysOp: Unknown.

(516)754-8121, **Other Side of Spectrum** -- Fort Salonga, NY. 300/1200 baud, online 24 hrs. SysOp: Joseph Moon.

(516)935-2027, **SofSig BBS** -- Long Island, NY. unknown baud, online ?? hrs. SysOp: Unknown.

(517)394-2447, **Benchboard BBS** -- Lansing, MI. 300 baud, online 24 hrs. SysOp: John C. Evans.

(518)793-9574, **The HOST BBS** -- Glens Falls, NY. 300 baud, online 10pm - 6am. SysOp: Ross Calloway. Special purpose - catering to the handicapped.

(601)388-3490, **The Coastal Area BBS** -- Biloxi, MS. 3/12/24 baud, online 24 hrs. SysOp: David E. Warner. Message base forum and public domain software area for uploads and downloads. PLATO programmers SIG.

(601)497-6664, **Omni-Com BBS** -- Gautier, MS. 300/1200 baud, online 24 hrs. SysOp: Mark S. Welch. 7/E/1.

(601)832-9486, **ATAM (Midnight Rider)** -- Gulfport, MS. 300/1200 baud, online 4pm -12pm. SysOp: Thomas Merrell. Supporting Commodore and other computers..

(601)864-0261, **The Coast** -- Gulfport, MS. 300 baud, online 4pm - 11pm. SysOp: Chuck Rabbe. Supporting Commodore and other computers..

(601)875-8688, **Omni-Com BBS** -- Gautier, MS. 300/1200 baud, online 24 hrs. SysOp: Mark S. Welch. 7/E/1.

(602)984-4049, **QuestNet BBS** -- Mesa, AZ. 300 baud, online 24 hrs. SysOp: Unknown. 8/N/1 - A contemporary synthesis of science and religion. Electronic Mail - Electronic magazine.

(603)679-2445, **Center of the Universe** -- Epping, NH. 3/12/24 baud, online 24 hrs. SysOp: Unknown. Epson Band & Bugle Club BBS.

(604)721-3568, **Farwest RBBS** -- Victoria, B.C.. 1200/2400 baud, online 24 hrs. SysOp: R.G. L'Ecuyer. IBM and Compatibles.

(604)941-6027, **FOG - 2** -- Vancouver, Brit. Colum. 300/1200 baud, online 24 hrs. SysOp: Richard Earl. Vancouver Portable Computer Club (FOG AMO #17) member supported system. **PRACSA member**

(606)432-0879, **Strawberry Patch BBS** -- Pikeville, KY. 300/1200 baud, online 24 hrs. SysOp: Terry West. MS-DOS and Tandy CoCo.

(606)439-4209, **Coal Miner BBS** -- Hazard, KY. 300 baud, online ?? hrs. SysOp: Keith Smith. 8/1/N.

(607)732-4541, **Hobby House** -- Elmira, NY. 300/1200 baud, online ?? hrs. SysOp: Ray Labarr. System communicates at 8 bits/No parity/1 stop bit.

(608)251-7734, **CooperWorks** -- Madison, WI. 3/12/24 baud, online 24 hrs. SysOp: Charles D. Cooper.

(608)255-2755, **Bits II** -- Madison, WI. 3/12/24 baud, online 24 hrs. SysOp: Brian Goldsworthy. Primarily Apple.

(608)362-4742, **Boiler Room** -- Jamesville, WI. 300/1200 baud, online 24 hrs. SysOp: Unknown.

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Bulletin Board

(608)752-8123, **Star Fleet** -- Jamesville, WI. 300 baud, online 24 hrs. SysOp: Unknown.
(608)783-5755, **Microtech Dataline BBS** -- Onalaska, WI. unknown baud, online 24 hrs. SysOp: Elaine Mann. IBM and compatibles, Apple, Atari, Commodore & Tandy Color Computers.
(608)873-4700, **Daily Planet** -- Madison, WI. unknown baud, online ?? hrs. SysOp: Unknown.
(609)232-0773, **KMMM Pascal BBS** -- Bellmawr, NJ. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(609)232-1245, **Compu-Data** -- Turnersville, NJ. 3/12/24 baud, online 24 hrs. SysOp: Phil Gordemer. Online games.
(609)429-7792, Wilmington, DE. unknown baud, online 24 hrs. SysOp: Unknown. Delaware Valley Users Group (DVUG) (TI home computers).
(609)652-6030, **The Casino PC Board** -- Atlantic City, NJ. 3/12/24 baud, online 24 hrs. SysOp: Dave Schubert. Atlantic City Entertainment Guide. For IBM and compatibles only..
(609)696-0475, **Pab's Place** -- Vineland, NJ. 300 baud, online 24 hrs. SysOp: Unknown.
(609)866-9481, **BSS Systems & Software** -- Mt. Laurel, NJ. 3/12/24 baud, online ?? hrs. SysOp: Brian S. Sietz.
(612)446-1419, **Techie BBS** -- St. Paul, MN. unknown baud, online ?? hrs. SysOp: Unknown. TI-99/4A oriented.
(612)778-0506, **Twin City Express** -- Minneapolis/St. Paul. 3/12/24 baud, online 24 hrs. SysOp: James Meehan. Amiga, Atari-ST and Commodore 64/128 Only! XMODEM protocol..
(612)778-0686, **TC-Express Trading Co.** -- Minneapolis/St. Paul. 3/12/24 baud, online 24 hrs. SysOp: James Meehan. Software Exchange for C-64/128 Only! PUNTER & XMODEM protocols..
(612)938-4799, **TC-AMS** -- Minnetonka, MN. 1200/2400 baud, online 24 hrs. SysOp: Steve Sherwick. Registration required system. 8/N/1. Twin Cities Area Message System..
(614)593-1019, **FIDO 126/110** -- Athens, OH. 300/1200 baud, online 5pm - 7am. SysOp: Unknown. IBM-PC, Apple, Commodore, Timex. 8/N/1.
(614)593-4567, **Telecom BBS** -- Athens, OH. 300/1200 baud, online 24 hrs. SysOp: Unknown. IBM-PC 8/N/1.
(614)622-0565, **Utopia Network BBS** -- Coshocton, OH. unknown baud, online 7pm - 6am. SysOp: Bruce Uher. Online since November 1982..
(615)292-0710, **FOG -23** -- Nashville, TN. 3/12/24 baud, online 24 hrs. SysOp: Ernie Dryden. Nashville CP/M U G (FOG AMO #119) & North AL Osborne U G (FOG AMO #125) member supported system. **PRACSA member**
(615)387-2467, **Fort Apocalypse** -- Clarksville, TN. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(615)431-6180, **Kentuckian RBBS** -- Fort Campbell, KY. 300/1200 baud, online 24 hrs. SysOp: William Baskett.
(615)431-6857, **Ali's RCPM/MBBS** -- Fort Campbell, KY. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(615)472-5151, **The Tunnel** -- Chattanooga, TN. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(615)476-2913, **The Domain** -- Cleveland, TN. 300 baud, online 24 hrs. SysOp: Bucky Lawson. All computers welcome.
(615)526-3347, **Cumberland BBS** -- Cookeville, TN. 300/1200 baud, online 24 hrs. SysOp: Dean Carothers.
(615)645-5299, **Okie Bug** -- Clarksville, TN. 300 baud, online 3pm-9am (CST). SysOp: Ira Grims.
(615)822-6741, **Music City Macintosh** -- Hendersonville, TN. 300/1200 baud, online ?? hrs. SysOp: Jon Mir. 8/N/1.
(615)851-0427, **Nashville TIBBS** -- Nashville, TN. 300/1200 baud, online 5:00pm-6:00am. SysOp: Unknown.
(615)885-2515, **NASCOM** -- Nashville, TN. 300 baud, online 24 hrs. SysOp: Roy Odum. Supports Tandy and MS-DOS machines.
(615)885-4162, **Nash. Commodore BBS** -- Nashville, TN. 300/1200 baud, online ?? hrs. SysOp: Kenneth S. Harwell.
(615)970-7418, **Data-Comp Information** -- Alcoa, TN. unknown baud, online 24 hrs. SysOp: Rickie Belitz.
(615)983-6163, **Rebel Corner** --. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(616)335-5119, **Multi-Board** -- Holland, MI. unknown baud, online 24 hrs. SysOp: Richard Brockmeier. TRS, IBM, Amiga, Apple.
(616)946-6543, **C128 BBS** -- Traverse City, MI. 300/1200 baud, online 24 hrs. SysOp: Ronald Barber.
(616)962-0400, **B. C. Central** -- Battle Creek, MI. 3/12/24 baud, online 24 hrs. SysOp: Harmon Ruble. Large download area for all computers.
(616)984-5496, **MYBBS** -- Gowen, MI. 300 baud, online 24 hrs. SysOp: R. Christopherson. Commodore 64.
(617)288-4667, **Bar-Ken (FOG 29)** -- Boston, MA. 300/1200 baud, online 24 hrs. SysOp: John Kinsella. Boston Osborne Group (FOG AMO #122) member supported system. **PRACSA member**
(617)396-4607, **BCS Atari BBS** -- Boston, MA. unknown baud, online ?? hrs. SysOp: Harry Steele.
(617)429-1784, **Cul-De-Sac Bar & Grill** -- Holliston, MA. 3/12/24 baud, online 24 hrs. SysOp: Pete White. Commodore, others, Amateur Radio & humor.
(617)544-8401, **Orange Fido** -- Orange, MA. 3/12/24 baud, online 24 hrs. SysOp: David Kaufman. Computer tech talk and file transfer for all system types..
(617)641-4941, **BCS-Wang Consultants** -- Arlington, MA. 300/1200 baud, online 24 hrs. SysOp: Daniel Crawford.
(617)665-3796, **Wonderland BBS** -- Boston, MA. unknown baud, online ?? hrs. SysOp: Unknown.
(617)675-5979, **Spring-Board Network** -- Fall River, MA. 300/1200 baud, online 24 hrs. SysOp: David Springer. MS-DOS, Apple, Atari, Commodore, CP/M. Free access, uploads & downloads.
(617)721-1390, **The Star Chamber BBS** -- Winchester, MA. 300/1200 baud, online ?? hrs. SysOp: Tom Leonard.
(617)797-5788, **Cobra's Pit BBS (tm)** -- Worcester, MA. 300/1200 baud, online 24 hrs. SysOp: Joe Robles. Commodore users & others, free downloads.
(617)853-7420, **Mindlink Computer Sys.** -- Worchester, MA. unknown baud, online ?? hrs. SysOp: Dan Dixon.
(617)862-5779, **BCS/CUG BBS** -- Boston, MA. 300/1200 baud, online 24 hrs. SysOp: John Premack. Registration required.
(617)875-3618, **Xevious** -- Framingham, MA. 300 baud, online 24 hrs. SysOp: Nels Anderson. Also (617) 449-7322, direct user chat, 14 subboards, text files.
(617)975-4485, **The Bible Study** -- Lawrence, MA. 300/1200 baud, online 24 hrs. SysOp: Maurice Bergeron.
(618)632-9020, **Two Dogs, BBS** -- O'Fallon, IL. 300/1200 baud, online ?? hrs. SysOp: Eric W. Bulfinch.
(618)847-2291, **Nationserv** -- Fairfield, IL. 3/12/24 baud, online 24 hrs. SysOp: Ben H. Nation. IBM, Commodore, Tandy, any others.
(619)272-5553, San Diego, CA. 3/12/24 baud, online 24 hrs. SysOp: William Parish.
(619)279-2621, **Plain Brown Wrapper** -- San Diego, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. Adults Only, must be over 18.
(619)281-7222, **Proline [SOL]** -- San Diego, CA. 3/12/24 baud, online 24 hrs. SysOp: M. Davis.
(619)281-8721, **Online PC BBS** -- San Diego, CA. unknown baud, online 24 hrs. SysOp: Michael Smith.
(619)749-2741, **Public Domain SIG** -- Vista, CA. 300/1200 baud, online 24 hrs. SysOp: Bob Guru. Public domain software for IBM and compatibles.
(702)293-7008, **The Gate II** -- Nevada. 3/12/24 baud, online 24 hrs. SysOp: Unknown. Apple IIGS, IIe, MacIntosh.
(702)363-2111, **64 Swap II** -- , NV. 300 baud, online 24 hrs. SysOp: Unknown. File Transfer.
(702)734-0843, **Amiga Talk** -- Nevada. 300/1200 baud, online 4pm-12mid. SysOp: Unknown.
(702)734-0943, **Devil's Workshop AE** -- Nevada. 300/1200 baud, online 24 hrs. SysOp: Unknown. Pswd 645 BAM, AE, Cat-fur only.
(702)735-2787, **The Star Chamber II** -- Nevada. 300/1200 baud, online 6pm-4am M-F. SysOp: Unknown. Atari ST & RT, Pswd Yucca.
(702)878-9106, **PMS Nevada** -- Nevada. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(703)352-5842, Falls Church, VA. 300/1200 baud, online 24 hrs. SysOp: Bill Sanderson. Apple Software.
(703)590-9206, **Corvette Driver's** -- Woodbridge, VA. 300-19200 baud, online 24 hrs. SysOp: Dave Arline.
(703)620-0851, **Electronic Age** -- Oakton, VA. 300/1200 baud, online 24 hrs. SysOp: Michael Benson.
(703)734-1387, **AMRAD CBBS** -- McLean, VA. 1200 baud, online ?? hrs. SysOp: Terry Fox WB4JFI. Amateur Radio Operator oriented.
(703)786-4039, **Redline's Garage BBS** -- Fredericksburg, VA. 3/12/24 baud, online 24 hrs. SysOp: Joe McAllister.
(704)255-0032, **Access BBS** -- Asheville, NC. 300/1200 baud, online 24 hrs. SysOp: Bill Hines. Multiuser.
(704)264-7381, **TIE-TBBS Fido 151/305** -- Boone, NC. 3/12/24 baud, online 24 hrs. SysOp: Blaise Anderson. IBM/Apple/Commodore/CoCo SIGs E-mail and public-domain downloads.
(704)332-5439, **BT PCBBS** -- Charlotte, NC. unknown baud, online ?? hrs. SysOp: Unknown.
(704)366-9051, **KUG ROS -2** -- Charlotte, NC. 300/1200 baud, online 24 hrs. SysOp: Unknown. Up/download area, message base, and a utilities system..
(704)372-6225, **KUG ROS -1** -- Charlotte, NC. 300/1200 baud, online 24 hrs. SysOp: Unknown. Up/download area, message base, and a utilities system..
(704)535-7017, **PC-Mart BBS** -- Charlotte, NC. 3/12/24 baud, online 24 hrs. SysOp: Unknown.
(704)541-3776, **Queen City TIBBS** -- Charlotte, NC. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(704)552-7480, **XLR8ed BBS** -- Charlotte, NC. 3/12/24 baud, online 24 hrs. SysOp: Joe Venturelli. IBM/compatibles, MacIntosh, Atari ST, Amiga, Apple II, Atari 8-bit, C-64, C-128,.
(704)728-8534, **Hudson Area C-64 BBS** -- Hudson, NC. 300/1200 baud, online 24 hrs. SysOp: Benny Hayslett. C-64 Color/Graphic capability.
(705)253-5366, **Fisherman's Scroll** -- Sault Ste. Marie, ONT. 300/1200 baud, online ?? hrs. SysOp: Neil Trudel. System communicates at 8 bits/no parity/1 stop bit.
(705)746-9115, **Bob's Bored BBS** -- Parry Sound, Ontario. 300/1200 baud, online 24 hrs. SysOp: Bob Cooke. Supports ALL systems.
(707)437-4334, **Softy's Apple BBS** -- Fairfield, CA. 300/1200 baud, online 24 hrs. SysOp: John W. Hagen III. Online games, training, tech support. Alfa III BBS Sysop support (unofficial).
(707)557-4403, **Vallejo RCP/M (FOG 18)** -- Vallejo, CA. 300/1200 baud, online 24 hrs. SysOp: Ron Forsythe. CP/M and MS-DOS. **PRACSA member**
(707)964-7114, **M. C. A. B.** -- Fort Bragg, CA. 3/12/24 baud, online 24 Hours. SysOp: M. J. Martinez. Medocino Coast Advertising Bulletin.
(709)364-1078, **HOBBS** -- St. John's, NFLD. unknown baud, online ?? hrs. SysOp: Unknown.
(709)364-5512, **TIBBS** -- St. John's, NFLD. unknown baud, online ?? hrs. SysOp: Unknown.
(709)739-7353, **PCUG BBS** -- St John's, NFLD. unknown baud, online ?? hrs. SysOp: Unknown.
(709)753-0196, **Noparity BBS** -- St John's, NFLD. unknown baud, online ?? hrs. SysOp: Unknown.
(709)753-3259, **TABBS** -- St John's, NFLD. unknown baud, online 7pm - 7am. SysOp: Unknown.
(709)781-2676, **CARRICOM** -- St. John's, NFLD. unknown baud, online ?? hrs. SysOp: Unknown.
(713)353-5289, **Micrologic Concepts** -- Houston, TX. 300 baud, online 24 hrs. SysOp: David Weldon.
(713)537-0741, **The Phoenix TIBBS** -- Houston, TX. 300/1200 baud, online 24 hrs. SysOp: William H. Rister. Supporting TI-99/4A.
(713)896-8522, **PC SWAP** -- Houston, TX. 3/12/24 baud, online 24 hrs. SysOp: Chester Swap.
(713)955-9532, **H.A.S.T.E. BBS** -- Houston, TX. 3/12/24 baud, online 24 hrs. SysOp: Patrick Mahoney P. Houston Atari ST Enthusiast - public domain only.
(714)242-7440, **Commodore Corner** -- Moreno Valley, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown.
(714)540-7378, **Ornj Juice** -- Fountain Valley, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. Atari Computer Association of Orange County.
(714)547-0710, **T-Line BBS** -- Orange, CA. 3/12/24 baud, online 24 hrs. SysOp: Don Inglehart. 8/N/1, IBM, MS-DOS, TRS-80, Apple, Soft Mail, E-Mail, SIGs and downloads for all types of computers.
(714)622-3174, **Men's Room** -- Pomona, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #25).
(714)688-3204, **ST-Widowmaker BBS** -- Riverside, CA. 3/12/24 baud, online 24 hrs. SysOp: Richard Adkins. Supporting Atari-ST, Atari 8-bit, Apple-Macintosh.
(714)730-9749, **Resource** -- Santa Ana, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #06) multi-user.
(714)778-0948, **The Circuit Board** -- Anaheim, CA. 3/12/24 baud, online 24 hrs. SysOp: David Kleinschmidt. IBM-PC.
(714)861-7268, **Diamond Bar BBS** -- Diamond Bar, CA. 3/12/24 baud, online 24 hrs. SysOp: Jonathan Hart. Diamond Bar Commodore User's Group Punter Node 18.
(714)864-1907, **The Palace Hotel** -- San Bernardino, CA. 3/12/24 baud, online ?? hrs. SysOp: Duane Goldsworthy.
(715)341-6516, **Question Authority** -- Stevens Point, WI. 300/1200 baud, online 24 hrs. SysOp: Jeff Ramlow.
(715)344-7551, **Big Brother Systems** -- Stevens Point, WI. 300/1200 baud, online 24 hrs. SysOp: Richard Stuplich. 400 + G-Files.
(715)842-4850, **Wausau Online of WI** -- Wausau, WI. 300/1200 baud, online 24 hrs. SysOp: Mike Hofmann. Messages, SIGs, downloads, online mall, partial pay system.
(716)227-8157, **USS Liberty Vet. Assc.** -- Rochester, NY. unknown baud, online ?? hrs. SysOp: Unknown. U.S.S. Liberty Veterans Association BBS.
(716)248-3126, **Rochester Online** -- Rochester, NY. 300 baud, online 24 hrs. SysOp: John Panzica.
(716)835-5802, **Think Tank Atari** -- Buffalo, NY. 300/1200 baud, online 9pm-9am. SysOp: Prenell Quarles.
(717)235-7599, **Black Magic RPG** -- Glen Rock, PA. 300 baud, online 24 hrs. SysOp: Unknown. Commodore & compatibles.
(717)275-0666, **The Carrier** -- Bloomsburg, PA. 300 baud, online 24 hrs. SysOp: Joseph Manning.
(717)394-1357, **Lancaster Area BB** -- Lancaster, PA. 300/1200 baud, online 24 hrs. SysOp: Chris Harrower.
(717)454-4220, **Mission:Impossible BBS** -- Hazelton, PA. 300 baud, online 24 hrs. SysOp: Rich Green. Dedicated to Atari Computer users.
(717)561-0977, **Distant Traveller BBS** -- Harrisburg, PA. 300/1200 baud, online 24 hrs. SysOp: Unknown. Games, message bases, downloads.
(717)621-2935, **The Apple Orchard** -- Pottsville, PA. 300/1200 baud, online 24 hrs. SysOp: Ronald F. Nocket. Email and exchanging software..
(717)645-4992, **The Paranormal BBS** -- Lansford, PA. 300/1200 baud, online 9pm - 9am. SysOp: Chris Caldwell.
(717)657-8699, **FOG -10** -- Harrisburg, PA. 3/12/24 baud, online 24 hrs. SysOp: George Peace. CP/M + software. **PRACSA member**
(717)834-9421, **Perry County BBS** -- Duncannon, PA. 300 baud, online 24 hrs. SysOp: Roger Kumley.
(718)238-7855, **Atlantic Palisades** --. 2400 baud, online ?? hrs. SysOp: Unknown.
(718)351-3859, **Ariel** --. unknown baud, online 24 hrs. SysOp: Anneliese Sessa.
(718)352-1949, **JCN Al Bulletin Board** -- Flushing, NY. 1200 baud, online 7pm-11pm EST. SysOp: Blaise Scelsi.
(718)444-4555, **Brooklyn College** --. 2400 baud, online ?? hrs. SysOp: Unknown.
(718)482-0089, **The Apple Cider BBS** -- Queens, NY. 300/1200 baud, online 24 hrs. SysOp: Greg Trobaugh. Online support for all things computer.
(718)492-3054, **The Outer Limits BBS** -- Brooklyn, NY. 300/1200 baud, online 24 hrs. SysOp: Unknown. Lotz of files..
(718)539-3560, **NYAAC** --. 2400 baud, online ?? hrs. SysOp: Unknown.
(718)604-1930, **Blaise Pascal** --. 1200 baud, online ?? hrs. SysOp: Unknown.
(718)643-5319, **Fairfax** --. 2400 baud, online ?? hrs. SysOp: Unknown.
(718)720-7673, **Nova Labs** --. 2400 baud, online ?? hrs. SysOp: Unknown.
(718)746-1140, **Tele-Master:Online Sys** --. 3/12/24 baud, online 24 hrs. SysOp: George Mihalios.
(718)894-0039, **Alternate Universe** -- Middle Village, NY. unknown baud, online 11pm-7am. SysOp: Michael Manicone.
(718)956-7748, **Creative Services** --. 2400 baud, online ?? hrs. SysOp: Unknown.
(718)963-2189, **Tele-Master: F.C.C.** -- ????, NY. 300/1200 baud, online 24 hrs. SysOp: Richard Ho.
(718)967-2974, **Grand Central** --. 2400 baud, online ?? hrs. SysOp: Unknown. Also referred to as NY Computer Society.
(800)654-1656, **M. C. A. B.** -- Fort Bragg, CA. 3/12/24 baud, online 7p-8aM-F 24S-S. SysOp: M. J. Martinez. Mendocino Coast Advertising Bulletin. Northern CA counties only toll free.
(801)466-3957, **JA NE'T Global BBS** -- Salt Lake City, UT. 10am-7pm baud, online 300. SysOp: Maureen Janney. IBM compatibles, Commodore, Apple. Entrepreneur, barter, trade, sell worldwide. No membership fee..
(802)672-5238, **Bridgewater Syslink** -- Bridgewater, VT. 300/1200 baud, online ?? hrs. SysOp: Chuck Clagett. 8/N/1.
(803)238-3037, **Fiend Formula** -- Myrtle Beach, SC. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #12).

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6300 640K 1 Drive Mono $1609.00
6300 640K 2 Drives Mono $1779.00
6300 640K 20MB Mono $2595.00
7300 1MB Ram w/20MB Mono $3599.00

PANASONIC

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SR Partner 256K 20MB $1699.00
SR Partner 256K 2 Drives $1195.00
Exec Partner 2 Drives $1649.00
Exec Partner 10MB ..$2499.00

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FX-600 2 DR Mono ...$899.00
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VENTEL

1200 Halfcard w/Crosstalk $349.00
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PC 1200 External $339.00
PC 2400 External $439.00

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310A Monochrome Amber $149.00

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SR-12 HI Res Color ...$559.00

TAXAN

630 RGB Color $427.00
640 RGB Color $479.00

INTERNAL BOARDS

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Sixpack 64K w/Sidekick $189.00
Sixpack 384K w/Sidekick $229.00
Advantage 1.5MB $569.00
Advantage 3MB $969.00
5250-11 Package $569.00
5250-12 Package $525.00

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IRMA $755.00

EVEREX

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Grafic Edge $298.00
Mini Magic Card 384K....$128

HERCULES

Mono Graphics Card...$189.00
Color Card $159.00

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AT Above Board 2MB .$629.00

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Quadboard 384K $199.00
Quadsprint $299.00
Quadlink $359.00

SIGMA

Color 400 Video Card..$429.00

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Bulletin Board

(803)366-6235, **Critical Mass BBS** -- Rock Hill, SC. 3/12/24 baud, online 24 hrs. SysOp: John Threatt. Amiga, BBS-PC.

(803)585-8575, **The Alliance Francaise** -- Spartanburg, SC. 3/12/24 baud, online 24 hrs. SysOp: Pascal Roy. Promotion of French language and culture, bilingual French/English.

(803)686-5978, **Hilton Head on Line** -- Hilton Head, SC. 3/12/24 baud, online 24 hrs. SysOp: Robert Manis. IBM Software.

(803)764-0150, **The Miner 99'er** -- Goose Creek, SC. 300/1200 baud, online 24 hrs. SysOp: Walt Inmon.

(803)775-2080, **The Depot Connection** -- Sumter, SC. 300/1200 baud, online 24 hrs. SysOp: Earl T. William. All computer types..

(803)875-5537, **Summerville - 80** -- Charleston, SC. 3/12/24 baud, online 24 hrs. SysOp: Ralph Martin. MS-DOS, Commodore, Atari.

(804)229-3929, **Masters Syslink** -- Williamsburg, VA. 300/1200 baud, online ?? hrs. SysOp: Fred Whittom. System communicates at 8 bits/no parity/1 stop bit.

(804)486-1484, **Tidewater TIBBS** -- Newport News, VA. unknown baud, online ?? hrs. SysOp: Unknown.

(804)590-9369, **Aviator's Haven BBS** -- Chesterfield, VA. 300/1200 baud, online ?? hrs. SysOp: Sonny Thompson. 8/N/1. Directly supports IBM-R5M100 and Apple. Boards and downloads for all computers.

(804)596-4838, **MS-BBS** -- Newport News, VA. 3/12/24 baud, online 24 hrs. SysOp: David Stotts. Online for 3 years, registration required w/same day verification. Online games. 2 phone lines..

(804)748-9236, **Aviator's Haven BBS** -- Chesterfield, VA. 300/1200 baud, online ?? hrs. SysOp: Sonny Thompson. 8/N/1. Directly supports IBM-R5M100 and Apple. Boards and downloads for all computers.

(804)874-7902, **ASC Enterprises** -- Newport News, VA. 300/1200 baud, online 24 hrs. SysOp: ASC A.

(805)399-1887, **Mustang Wildcat! BBS** -- Bakersfield, CA. 3/12/24 baud, online 24 hrs. SysOp: Jim Harrer. Mustang Software-operated board, Games, Stock updates.

(805)484-9343, **Royal Connection II** -- Camarillo, CA. 3/12/24 baud, online 24 hrs. SysOp: Charles Besson. IBM, MS-DOS and compatibles.

(806)355-3031, **Love Board** -- Amarillo, TX. 300/1200 baud, online 24 hrs. SysOp: Wayne Martin. Church oriented. P.A.S.S. affiliated.

(806)358-2036, **Atlantis!** -- Amarillo, TX. 300/1200 baud, online 24 hrs. SysOp: David Corbin.

(806)358-2785, **The Network** -- Amarillo, TX. 300/1200 baud, online 24 hrs. SysOp: Paul Qualls. P.A.S.S. affiliated.

(806)359-5655, **Havocland** -- Amarillo, TX. 300/1200 baud, online 24 hrs. SysOp: Randolph Andrews. Online role playing games, solo adventures. P.A.S.S. affiliated.

(806)371-5235, **ACes** -- Amarillo, TX. 300/1200 baud, online 24 hrs. SysOp: Philip M. Spray,PE. Academic oriented. P.A.S.S. affiliated.

(806)371-8900, **Amarillo Online** -- Amarillo, TX. 300/1200 baud, online 24 hrs. SysOp: L.G. McCaw. Message bases & downloads, fake name area. P.A.S.S. affiliated.

(806)372-7883, **Golden Bill*Board** -- Amarillo, TX. 300/1200 baud, online 24 hrs. SysOp: Bill Campbell. Store owned, catalog info on line..

(806)373-3953, **Aerie** -- Amarillo, TX. 300/1200 baud, online 24 hrs. SysOp: Bill Robb. Fun & frolic, fake name area. P.A.S.S. affiliated.

(806)374-9711, **The Burg Board System** -- Amarillo, TX. 3/12/24 baud, online 24 hrs. SysOp: Tom Whittenburg. Large message base, download library. P.A.S.S. affiliated.

(806)381-2932, **The Attic** -- Amarillo, TX. 300/1200 baud, online 24 hrs. SysOp: Mike Gilliam. Online games, message base. P.A.S.S. affiliated.

(806)381-8214, **Byte The Bullet** -- Amarillo, TX. 300 baud, online 24 hrs. SysOp: Richard Spears. Message bases, online stock market game. P.A.S.S. affiliated.

(806)383-0602, **Mystic Mountain** -- Amarillo, TX. 300 baud, online 24 hrs. SysOp: David Rula.

(806)383-2270, **Golden Spread Data Exc** -- Amarillo, TX. 300 baud, online 24 hrs. SysOp: Herman Green. TI Users. P.A.S.S. affiliated..

(806)655-9936, **Illusionet** -- Canyon, TX. 300 baud, online 24 hrs. SysOp: Gerald Anderson. Fake name only board, role playing game situation..

(812)423-4535, **Star Base BBS** -- ,. 300/1200 baud, online 24 hrs. SysOp: Rick Cox.

(812)824-8298, **The Magic of Xanth** -- Bloomington, IN. 300/1200 baud, online 24 hrs. SysOp: John Wojt. 8/N/1.

(812)877-2564, **Belinda** -- Terne Havte, IN. unknown baud, online ?? hrs. SysOp: Tim Schmitt.

(812)988-2007, **The Round Table** -- Nashville, IN. 300/1200 baud, online 24 hrs. SysOp: John Abbett. 8/N/1.

(813)254-7710, **The Sands of Babylon** -- Dover, FL. 300/1200 baud, online 24 hrs. SysOp: Clarence Simms.

(813)332-0617, **Divers-Net** -- Ft. Myers, FL. 300/1200 baud, online ?? hrs. SysOp: Harold Abbott. System communicates at 8 bits/no parity/1 stop bit.

(813)345-0937, **Interludes** -- St. Petersburg, FL. 300/1200 baud, online 24 hrs. SysOp: Karl Ludolph. (Oracomm #10).

(813)455-8449, **Dial-Your-Match -276** -- Naples, FL. 300/1200 baud, online 24 hrs. SysOp: Kevin S. Stone.

(813)684-0354, **The Dark Side BBS** -- Tampa, FL. 300 baud, online 10:00pm-7:30am. SysOp: John Bullard.

(813)684-5248, **The John Galt Line** -- Tampa, FL. 300/1200 baud, online 24 hrs. SysOp: Adam Baldwin. (Oracomm #28).

(813)726-3449, **The Harbor Lights** -- Safety Harbor, FL. 300/1200 baud, online 24 hrs. SysOp: Thomas Davis.

(813)747-2081, **Action Link** -- Bradenton, FL. 300/1200 baud, online 24 hrs. SysOp: Jim Davie. Supports IBM and MS-DOS compatibles & TI-99/4A computers.

(813)786-5460, Clearwater, FL. 300/1200 baud, online 24 hrs. SysOp: George Lysy.

(813)787-1639, **Coastland RBBS-PC** -- Palm Harbor, FL. 300/1200 baud, online ?? hrs. SysOp: Dale Shank. ANSI Graphics & color. Adult message area, s/w & h/w reviews, tech help, want ads & bulletins.

(813)862-8806, **Studio-64** -- Hudson, FL. 300/1200 baud, online 24 hrs. SysOp: Ralph LoBianco. A Commodore BBS & Online Store.

(813)882-0494, **CAD Connection** -- Tampa, FL. 300/1200 baud, online 24 hrs. SysOp: Kenneth Johnson.

(813)989-9128, **Comtel 64 BBS** -- Tampa, FL. unknown baud, online 24 hrs. SysOp: M. Fontaine. Commordore BBS - Supports CBM and CP/M. Color and Graphics.

(814)664-2877, **The Byte Shop** --. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(816)827-3027, **The Freeworld** -- Sedalia, MO. 300 baud, online 24 hrs. SysOp: Eric Bartlett.

(817)284-1520, **Genesis I** -- Hurst, TX. 300/1200 baud, online 24 hrs. SysOp: Unknown. Supports all computers.

(817)346-9552, **Six Macs over Texas** -- Fort Worth, TX. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(817)754-1568, **Waco's Connection 80** -- Waco, TX. 300/1200 baud, online 24 hrs. SysOp: Tom Kilbride.

(818)248-0562, **The Dugout BBS** -- La Crescenta, CA. 300 baud, online 6pm-11pm PST. SysOp: Jim Edwards.

(818)334-0902, **Point of Entry** -- Azusa, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #38).

(818)347-8322, **Price Buster Classifie** -- Chatsworth, CA. 300 baud, online 24 hrs. SysOp: Unknown. CAT Systems. Nation-wide private party ads for a printed publication.

(818)359-2590, **Terminal Island** -- Monrovia, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #09) multi-user.

(818)363-3505, **The Way RBBS** -- Tarzana, CA. 3/12/24 baud, online 24 hrs. SysOp: Jon DeKeles.

(818)446-5937, **FOG -36** -- Arcadia, CA. 3/12/24 baud, online 8AM-10PM. SysOp: Richard Smith. Sponsored OKOK (FOG AMO #84) members.

(818)509-9681, **Oracomm -1** -- North Hollywood, CA. 300/1200 baud, online 24 hrs. SysOp: Gary O. Young. beta site -- multi-user.

(818)766-3735, **DownUnder** -- North Hollywood. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #05) multi-user. Specializing in games and downloading pictures..

(818)796-0069, **Bath House** -- Pasadena, CA. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #02).

(818)882-6045, **TUG-Net** -- Chatsworth, CA. 300/1200 baud, online 24 hrs. SysOp: Bob Koller. FOG Remote System #16 -- Technical User Group Network (FOG AMO #106) member supported system. **PRACSA member**

(818)913-8550, **Mission Control** -- Rowland Heights, CA. 3/12/24 baud, online 24 hrs. SysOp: Unknown.

(818)954-0530, **AT&T PC6300 Usr Gr BBS** -- Burbank, CA. unknown baud, online 24 hrs. SysOp: Eric Levinson. (Oracomm #23) 8/N/1.

(818)954-0800, **The Underground RBBS** -- Burbank, CA. 3/12/24 baud, online 24 hrs. SysOp: Larry Shadle. Multi-interest, supporting IBM-PC and Compatibles.

(818)980-6743, **Oracle** -- North Hollywood, CA. 300/1200 baud, online 24 hrs. SysOp: Gary O. Young. (Oracomm #00) multi-user.

(901)278-0167, **Ganymede** -- Memphis, TN. unknown baud, online 24 hrs. SysOp: Donald D. DuPuy. (Adult).

(901)357-5425, **TIBBS of Memphis** -- Memphis, TN. 300/1200 baud, online 24 hrs. SysOp: Pierre Lamontagne.

(901)726-5623, **Risky Business** -- Memphis, TN. 300/1200 baud, online ?? hrs. SysOp: Beery Miller.

(901)744-4180, **Forum 80** --. 300/1200 baud, online ?? hrs. SysOp: Rick Glisson.

(904)262-6761, **The Busdepot** -- Jacksonville, FL. 300/1200 baud, online 24 hrs. SysOp: Felix Pendas.

(904)265-4643, **House of Help** -- Youngstown, FL. 3/12/24 baud, online 24 hrs. SysOp: Jack Pizza. Commodore 128.

(904)265-4902, **Montego Bay** -- Panama City, FL. 300/1200 baud, online 24 hrs. SysOp: Zack Taylor. Supports ASCII & ATASCII, online Adventures, music charts, user novel, current events, animations.

(904)286-5957, **Dog House** -- ,. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(904)375-0059, **Esoteric Oracle** -- Gainesville, FL. 3/12/24 baud, online 24 hrs. SysOp: Jason Cook.

(904)378-4296, **SUPER SAT/COM BBS** -- Gainesville, FL. 3/12/24 baud, online 24 hrs. SysOp: Robert L Thibodeau. Serve 7 major brands of computers with SIGs and XMODEM protocol downloads for each.

(904)383-1133, **Central BBS** -- Mt. Dora, FL. unknown baud, online 24 hrs. SysOp: Michael E. Meyer.

(904)432-7285, **Commodore Country** -- Pensacola, FL. unknown baud, online 8pm-10pm. SysOp: Unknown.

(904)434-8536, **Gulf Power** -- Pensacola, FL. unknown baud, online 5pm-8am. SysOp: Dike & Mike Walker.

(904)453-4201, **After Hours BBS** -- Pensacola, FL. unknown baud, online 4pm-12pm M-F. SysOp: Tom Renfroe.

(904)453-4663, **TIU -- Pensacola, FL. unknown baud, online 24 hrs. SysOp: Unknown.**

(904)453-6547, USS Enterprise -- Pensacola, FL. unknown baud, online 8pm-8am F-Su. SysOp: Unknown.

(904)455-2626, **Spy's Nest** -- Pensacola, FL. unknown baud, online 8pm-7am. SysOp: Unknown.

(904)455-3612, **USS Defiance** -- Pensacola, FL. unknown baud, online 8pm-8am F-Su. SysOp: Unknown.

(904)455-7838, **Brew Masters** -- Pensacola, FL. unknown baud, online 6pm-9am. SysOp: Unknown.

(904)456-6633, **Alpha Omega** -- Pensacola, FL. unknown baud, online 6pm-8am. SysOp: Unknown.

(904)456-8205, **C.U.G.O.P.** -- Pensacola, FL. unknown baud, online 24 hrs. SysOp: Jim May.

(904)474-2027, **Reading Doctor** -- Pensacola, FL. unknown baud, online 6pm-8am M-F. SysOp: Unknown.

(904)474-9322, **Dragon's Lair** -- Pensacola, FL. unknown baud, online 24 hrs. SysOp: Unknown.

(904)477-3928, **CBM High** -- Pensacola, FL. unknown baud, online 24 hrs. SysOp: Unknown.

(904)478-1843, **Ardin Computers** -- Pensacola, FL. unknown baud, online 24 hrs. SysOp: Unknown.

(904)478-6722, **Metalstorm** -- Pensacola, FL. unknown baud, online 24 hrs. SysOp: Unknown.

(904)744-1948, **The Teleport** -- Jacksonville, FL. 300/1200 baud, online 24 hrs. SysOp: William Tomlinson. Apple, Atari, Commodore.

(904)763-5651, **The Bird Cage** -- Panama City, FL. 300 baud, online 24 hrs. SysOp: Unknown.

(904)769-3020, **The Nite Owl** -- ,. 300/1200 baud, online 7pm-1am. SysOp: Unknown.

(904)784-0283, **Dan's Bar and Grill** -- Panama City, FL. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(904)784-0342, **The Network** -- Panama City, FL. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(904)784-9492, **The Mental Ward** -- Panama City, FL. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(904)785-6940, **300/1200** -- Panama City, FL. The Network baud, online 24 hrs. SysOp: Unknown.

(904)785-9996, **TIM's Mansion** -- Panama City, FL. 300/1200 baud, online 24 hrs. SysOp: Unknown.

(904)878-4413, **The Exchange! RBBS-PC** -- Tallahassee, FL. 3/12/24 baud, online 24 hrs. SysOp: Doug Ferrell. Features message base, public domain files and radio frequency information.

(904)932-1880, **Exodus** -- Pensacola, FL. unknown baud, online 7pm-Midnight. SysOp: Unknown.

(904)944-2668, **Archie** -- Pensacola, FL. unknown baud, online 24 hrs. SysOp: Unknown.

(904)994-0255, **PCjr BBS** -- Pensacola, FL. unknown baud, online 6pm-midnight. SysOp: Steven Davis.

(904)994-2894, **Drafting Board** -- Pensacola, FL. unknown baud, online 8pm-6am. SysOp: Unknown.

(904)994-5542, **Pig Pen** -- Pensacola, FL. unknown baud, online 8pm-8am M-F. SysOp: Unknown.

(907)349-2459, **TW3 BBS & RCP/M³** -- Anchorage, AK. 3/12/24 baud, online 24 hrs. SysOp: Truman S. Walrod. GUIDE (FOG A.M.O. #63) member supported system.

(907)688-0143, **ZEE ZOO RBBS** -- Chugiak, AK. 300/450/1200 baud, online 24 hrs. SysOp: Paul Zumwalt. IBM-PC & compatibles games and graphics.

(911)556-6612, **Video-Talk** -- El Paso, TX. 300/1200 baud, online 24 hrs. SysOp: Ralf Zerbe.

(913)238-8595, **The Ozone BBS** -- Junction City, KS. 300/1200 baud, online 24 hrs. SysOp: Michael McGuire. IBM & compatibles.

(913)784-5983, **The XLS Board** -- Ft. Riley, KS. 300/1200 baud, online 5:30pm-4am. SysOp: Paul Bankston. IBM & compatibles.

(914)229-2735, **Blue Knight Network** -- Hide Park, NY. unknown baud, online 12am-6am F-S-S. SysOp: Bill McKay.

(914)238-8195, **The Works** -- Chappaqua, NY. 300/1200 baud, online 24 hrs. SysOp: Jason Scott.

(914)339-5476, **Kingston Software Exc.** -- Kingston, NY. unknown baud, online 10pm-7am. SysOp: Cornelius Stanley.

(914)343-8292, **Beta Projections RBBS** -- Middletown, NY. 3/12/24 baud, online 24 hrs. SysOp: Chuck Newman.

(914)355-3829, **VMS BBS** -- Suffern, NY. 300/1200 baud, online 24 hrs. SysOp: Larry Slonaker. Commodore 64/128, Apple, IBM, TRS-80, Atari.

(914)355-8102, **VMS BBS** -- Suffern, NY. 300/1200 baud, online 24 hrs. SysOp: Larry Slonaker. Commodore 64/128, Apple, IBM, TRS-80, Atari.

(914)454-2379, **Wild Row's Halnet BBS** -- Poughkeepsie, NY. unknown baud, online 6pm-2am. SysOp: Ronald E Scriviani.

(914)562-7837, **The AlterLink BBS** -- New Windsor, NY. 3/12/24 baud, online 24 hrs. SysOp: Richard D. Roos. IBM PC-XT,PC-Board - 8/N/1.

(914)564-7228, **All Night Connection** -- Newburgh, NY. 300/1200 baud, online 9pm - 7pm. SysOp: Michael A. Koby. All computers, contests with FREE prizes.

(914)758-0918, **R.H.O.B.B.** -- Red Hook, NY. 1200/2400 baud, online 24 hrs. SysOp: Joe Stanford. Supports most computers 8/N/1.

(915)566-6122, **Video-talk** -- El Paso, TX. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #34).

(915)821-0006, **Dial-Your-Match -152** -- El Paso, TX. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #16).

(915)855-1333, **Joe's Board** -- El Paso, TX. 300/1200 baud, online 24 hrs. SysOp: Joe Grossinger. Commodore.

(915)855-1503, **Hackers Hospice** -- El Paso, TX. 300/1200 baud, online 24 hrs. SysOp: Joe Grossinger.

(915)943-6401, **Monahans BBS** -- Monahans, TX. 300 baud, online 24 hrs. SysOp: John Hautzenroeder.

(916)268-1127, **Devil's Domain BBS** -- Grass Valley, CA. 3/12/24 baud, online 24 hrs. SysOp: Unknown.

(916)386-2521, **Omni-80/86** -- Sacramento, CA. 300/1200 baud, online 24 hrs. SysOp: Charles Meadows. On-line games.

(916)662-1838, **The Meeting Place** -- Woodland, CA. 3/12/24 baud, online 24 hrs. SysOp: Terry Brown. Online games/dating section/free downloads. All computer types welcome..

(916)927-3012, **Sac TIBBS** -- Sacramento, CA. 300/1200 baud, online 24 hrs. SysOp: Woody Large. XMODEM file transfers.

(919)383-8707, **Bull City TIBBS** -- Durham, NC. 300/1200 baud, online 24 hrs. SysOp: Roy Gurley. Multi-user UL/DL for C-64, C-128 and TI99/4A's.

(919)481-3368, **Matchmaker Internation** -- Cary, NC. 300/1200 baud, online 24 hrs. SysOp: Unknown. (Oracomm #37).

(919)497-0989, **All American BBS** -- Spring Lake, NC. 300/1200 baud, online 24 hrs. SysOp: Nickolai Smith.

(919)763-1850, **Wilmington-80 TBBS** -- Wilmington, NC. 300/1200 baud, online 24 hrs. SysOp: Mark Samwick.

(919)779-6674, **Micro Message Service** -- Raleigh, NC. 3/12/24 baud, online 24 hrs. SysOp: Michael Stroud. E/7/1 or N/8/1,Amiga/Atari/TRS-80/CoCo/C-64/C-128/IBM-PC/Apple/Model 100/CP/M, online SIGs/newsltrs.

(919)790-9470, **The Third Wave** -- Raleigh, NC. 3/12/24 baud, online 24 hrs. SysOp: Ken Zipin.

(919)934-3798, **EastCom** -- Smithfield, NC. 300/1200 baud, online 6pm-6am EST. SysOp: Roy Aycock.

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- ***Print Enhancement***—Automatically operates as a buffer for information to be printed. This frees the computer to do multiple tasks while printing.
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- ***Multiple Electronic RAM Disks***—FASTCARD IV provides electronic RAM disks which functions as very fast disk drives. You can set up any number of RAM disks of variable sizes.
- ***Remembers User Setups***—Like an IBM AT, FASTCARD IV remembers the most recent setups when the computer is turned off. When the computer is turned on, it automatically sets the memory configuration and addresses, disk and print buffer features, etc.
- ***Custom Password Security***—A custom password of any length may be defined that will be permanently stored in FASTCARD IV. Thereafter, whenever the computer is turned on, the password will be required before the computer will boot.
- ***Built-in Diagnostics***
- ***Fault Tolerance***—If faulty Expanded Memory is detected, the system bypasses it automatically.
- ***Automatic Setting of Expanded Memory RAM Address***—The address may be changed at your option.
- ***Software Controllable Page Register Addresses***—FASTCARD IV automatically sets page register address and, if you wish to change address, a simple, menu-driven program is used to do so.
- ***Conservation of RAM***—Since FASTCARD IV has utilities which are contained in firmware, system RAM is conserved for user applications.
- ***Automatic Memory Allocation***—Monitors the computer's operations and automatically allocates memory as it is needed to improve system performance. Any memory that is not being used for other purposes will automatically be used for disk and print enhancement.

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Users Groups

The User Group is a regular feature of the *Computer Shopper*. This is where you can list your computer user group at no charge. All listings are in state, area code, and city sequence. Foreign countries and SIGs are listed last. If you would like to have your group listed, follow the instructions listed below.

FOG (P. O. Box 3474, Daly City, CA, 94015, data: 415-755-8315) is THE International Nonprofit Computer Users Group and is devoted to the enhancement of the computer experience. Membership in **FOG** is $25 per year and includes a subscription to one of the **FOG** publications and much more. If you are interested in more information about **FOG**, send a large SASE to the address above.

This listing is provided by **FOG** members for the computer community. Regardless of what other groups a user belongs to, a local group can provide valuable assistance in learning more about your computer. Use this listing to find the group nearest you.

Submission Policy

All user group entries must be submitted in **writing** by the first of every month. **Submissions received by the first of April** (at **FOG** office) the will appear in the June issue. The listing will be good for three issues. **If an update report is not received** every three months, the listing will be deleted. Once their group is on the list, some groups just add **FOG** to their mailing list. Please remember that we can only scan most newsletters so be sure to highlight any changes. Group officers are responsible for promptly forwarding accurate information to:

FOG
User Group listing
P. O. Box 3474
Daly City, CA 94015-0474

We are not responsible for errors published in these listings.

AK 907

490-Kodiac Area FIG, c/o Horace Simmons. 907-486-5049
FOG – 63–Generic Users Info & Devel Exchange (GUIDE), c/o John Lynn, 7013 Trafford Ave., Anchorage, AK 99504. 907-272-7914
FOG – 89–Ketchican CP/M Users Group (KCPM), c/o Duane H. Fisher Jr., 1182 Black Bear Road, Ketchikan, AK 99901. 907-225-9249
FOG – 83–Baranof Users' Group (BUG), c/o Irene Shuler, Box 438, Sitka, AK 99835. 907-747-8615
FOG – 18–PENFOG (PENFOG), c/o Kenai Peninsula Community Coll, Box 848, Soldotna, AK 99669. 907-262-5801

AL 205

489-Huntsville FIG, c/o Tom Konantz. 205-881-6483
FOG – 49–First Alabama O U G (FAOUG), c/o Ed Burquez, 303 North Hwy 47, Columbiana, AL 35051. 205-669-5200
FOG –125–North Alabama Osborne Users Group (NAOUG), c/o John Heaman, 8705 Valley View Drive S.E., Huntsville, AL 35802. 205-881-0377
95-Huntsville AL Commodore Komp. Soc. (HACKS), P. O. Box 14356, Huntsville, AL 35815. 205-881-5633
98-South Alabama Apple Users Group (SAPPLE), P. O. Box 8894, Mobile, AL 36608-0894. 205-661-0931
306-Greater Gulf Coast Computer Club (G2C3), c/o Spring Hill College, Mobile, AL 36608.

AR 501

307-Tri-State HUG (Tri-State HUG), c/o Gil Hoellerich, 2617 Country Way, Fayetteville, AR 72703. 501-521-4818
FOG – 23–AFOG (AFOG), c/o Data-Tronics Corp., Box 853, Fort Smith, AR 72902-0853. 501-646-4617
308-Hot Springs Multi-Users Group, c/o Computerworks, P. O. Box 1193, Hot Springs, AR 71902.
309-Little Rock CP/M-MS/DOS Tech User G, c/o Elmer A. Wingfield, 26 Belmont Drive, Little Rock, AR 72204.
493-Central Arkansas FIG, c/o Gary Smith, P. O. Drawer 7680, Little Rock, AR 72217. 501-227-7817
147-Helena-WestHelena Micro-Computer UG, P. O. Box 2184, West Helena, AR 72390. 501-572-5503

AZ 602

491-Phoenix FIG, c/o Dennis L. Wilson. 602-956-7678
492-Tuscon FIG, c/o John C. Mead. 602-323-9763
614-Commodore User Group of Arizona, c/o Bob Spriet, P. O. Box 21291, Phoenix, AZ 85036. 602-893-2133
FOG –100–Tempe Osborne Group (TOG), 2537 North 65th Street, Scottsdale, AZ 85257. 602-994-0069
311-Arizona Commodore Users Group (ACUG), P. O. Box 27201, Tempe, AZ 85282. 602-839-4557
310-Gila Valley Apple Growers Assoc, P. O. Box 809, Thatcher, AZ 85552. 602-428-4073
144-Sun Heath Users Group (SUNHUG), c/o Stanley Mead, 234 N. Cuesta Avenue, Tucson, AZ 85745. 602-622-5369
572-Tuscon Apple Core (TAC), c/o Clay Evitts, 8830 East Speedway, Tuscon, AZ 85710. 602-296-5491

CA 209

500-Stockton FIG, c/o Doug Dillon. 209-931-2448
FOG – 35–Small Machine User's Group (SMUG), c/o Bill Houk, 6253 North Colonial, Fresno, CA 93704. 209-431-0480
312-Timex Z80 Users Group, c/o Ed Burton, 1611 Rose Avenue, Merced, CA 95340.
623-Valley Computer Club (VCC), c/o Pro-Consul Inc., 11306 Scarlett Oak Road, Oakdale, CA 95361. 209-847-9411
FOG – 66--South Valley FOG (SVFOG), c/o Olson Computer Services, 1502 North Lowery Street, Porterville, CA 93257. 209-781-4123
FOG – 11–Stockton Osborne Group (SOG), c/o Rod Payne, 4600 N. Pershing Avenue #C, Stockton, CA 95207-6789. 209-951-4701
FOG –139–Stockton Commodore 64 Users Group (C-64), c/o Rita McCann, 2929 Calariva Drive, Stockton, CA 95204. 209-948-5890

CA 213

494-Los Angeles FIG, c/o Phillip Wasson. 213-649-1428
613-Valley Computer Club, P. O. Box 6545, Burbank, CA 91510-6545. 213-221-4433
456-UCLA PC Users Group, c/o Attn: Schroth, NPI 77-365, 760 Westwood Plaza, Los Angeles, CA 90024. 213-473-6668
488-Southwest PC Users Group, c/o Christine Tripp, P. O. Box 78785, Los Angeles, CA 90016. 213-935-4105
574-Cantell Commodore Mail Users Group (CMUG), c/o Robert E. Cantell, 3119 Isabel Drive, Los Angeles, CA 90065.
437-Greater South Bay PC Users Group, P. O. Box 1937, Redondo Beach, CA 90278. 213-398-8153
164-South Bay Computer Education Group, 23121 South Western Avenue, Torrance, CA 90501.

CA 408

495-Monterey/Salinas FIG, c/o Bud Devins. 408-633-3253
499-Bay Area FIG, c/o John Hall. 415-532-1115
FOG –116–CP/M Users of Santa Cruz (CP/MUSC), c/o John Campbell, P. O. Box 628, Ben Lomond, CA 95005. 408-476-0504
314-Gavilan Users Group, c/o R. W. Brown, 780 Manx Avenue, Campbell, CA 95008. 408-379-2774
315-Byte Bandits of America, c/o R. W. Brown, 780 Manx Avenue, Campbell, CA 95008. 408-379-2774
313-Groups Using Timex Sinclair of S V (GUTS/SV), c/o Bill Miller, 6675 Clifford Drive, Cupertino, CA 95014-4530. 408-253-3175
439-Silicon Valley Computer Society (SVCS), c/o Kent Safford, 2464 El Camino Real Suite #190, Santa Clara, CA 95051. 408-286-2969
FOG – 1–First FOG of Silicon Valley (1st FOG SV), c/o Glen W. Stinnett, 21240 Canyon View Drive, Saratoga, CA 95070. 408-371-8699
FOG – 5–Monterey Bay Area O U G (MBAOUG), c/o Freedom Fastprint, 178 Barbara Way, Watsonville, CA 95076. 408-728-1416

CA 415

443-Coleco Adam Users' Group (CAUG), c/o Robert F. Baker, 2007 Lincoln Ave Apt C, Alameda, CA 94501.
465-East Bay Z80 Users Grp Timex-Sincl., 3128 King Street, Berkeley, CA 94703. 415-465-3116
468-Uni-Ops, c/o Walter Zintz, P.O. Box 27097, Concord, CA 94527-0097.
316-TRS Nybblers, c/o Dr.M. Edwards, Chabot College, 25555 Hesperian Blvd, Hayward, CA 94545. 415-846-3575
321-San Francisco TI 99ers, c/o Gary L. Anderson, 24816 Mango Street, Hayward, CA 94545.
FOG – 68–San Mateo Osborne Group (SMOG3), c/o Philip A. Moore, 1331 Crane Street, Menlo Park, CA 94025. 415-325-2442
317-Small Computer Users of Marin, c/o Computer Systems of Marin, 301 Poplar Street, Mill Valley, CA 94941. 415-388-4805
444-Apple III Users of No. Calif, 220 Redwood Hwy #184, Mill Valley, CA 94901. 415-383-0203
FOG – 31–Marin Osborne Group (MOG), P. O. Box 1726, Novato, CA 94948. 415-897-0629
FOG – 3–East Bay FOG (EBFOG), c/o Patricia Watters, 5497 Taft Avenue, Oakland, CA 94618. 415-272-9099
93-Bay Area Kaypro Users & Programmers, P. O. Box 20181, Oakland, CA 94620. 415-934-1927
594-Bay Area NEC/100 User's Group, c/o Truly Portable, P. O. Box 2916, Oakland, CA 94609. 415-658-1889
320-CLUB 100: Model 100 Users Group (CLUB 100), c/o Richard Hanson, P. O. Box 23438, Pleasant Hill, CA 94523. 415-932-8856
629-Marin Sonoma PC Users Group (MSPCUG), P. O. Box 1827, San Anselmo, CA 94960. 415-525-8500
318-San Mateo TRS-80 Users Group, 2691 Cottonwood Drive, San Bruno, CA 94066. 415-873-5107
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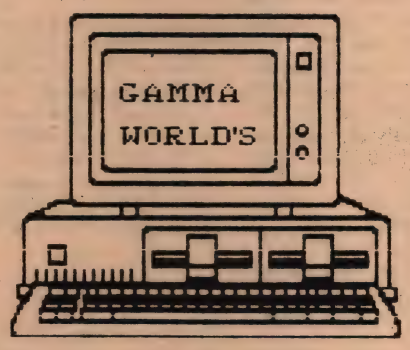

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153-PC Clone User Group (PCCUG), 431 Ashbury Street, San Francisco, CA 94117. 415-626-3549
304-First Attache Users Group (FAUG), 1827 Haight Street #16, San Francisco, CA 94117-2791. 415-221-3415
605-Computer Alliance, c/o Media Alliance, Ft. Mason Bldg E, Room 205, San Francisco, CA 94123. 415-771-7133
158-San Leandro Apple Eaters Users Grp, c/o Bob Shayler, 2200 Bancroft Ave., San Leandro, CA 94577.
48-Peninsula Kaypro Users Group (KAYFUN), c/o Ernest Hintz, P.O. Box 5405, San Mateo, CA 94402. 415-593-9981
79-Stanford Palo Alto User Group, P. O. Box 3738, Stanford, CA 94305. 415-322-3850
FOG – 60–Mt. Diablo Osborne Group (MTDOG), c/o Larry's Booknook, 730 - A Bancroft Road, Walnut Creek, CA 94598. 415-933-2665
606-Sanyo PC Hackers International, c/o Victor R. Frank, 12450 Skyline Blvd, Woodside, CA 94062. 415-851-7031

CA 619

497-San Diego FIG, c/o Guy Kelly. 619-268-3100 X 4784
FOG –114–High Desert Osborne Group (HOG), c/o Johnson - McClure Computing, 71845-A 29 Palms Hwy, Twentynine Palms, CA 92277. 619-367-2440

CA 707

FOG – 6–Microcomputer U G of Solano & Yolo (MUGSY), c/o Ron Forsythe, P. O. Box 1011, Fairfield, CA 94533. 707-557-5162
FOG – 29–Humboldt Osborne Group (HOG), c/o R C Electronics, P. O. Box 2751, McKinleyville, CA 95521. 707-445-2074
FOG – 56–North Bay FOG (NBFOG), c/o Valley Oak Apts, 2600 North Coast Street, Santa Rosa, CA 95401. 707-526-0250

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496-Orange County FIG, c/o Noshir Jesung. 714-842-3032
FOG –113–North Orange County C C Osborne SIG (NOCOSIG), c/o Scott Cosel, 9091 Holder Street, #128, Cypress, CA 90630-5855. 714-952-5627
457-Moreno Valley Commodore Users Group, PO Box 5494, Riverside, CA 92517.
589-T I Riverside User Group, c/o Ed Butcher, 3523 McKinley Stret, Riverside, CA 92506. 714-686-0336

CA 805

323-San Fernando Valley 99ers, P. O. Box 1844, Canyon Country, CA 91351. 805-255-7583
FOG – 47–Central Coast Osborne Group (CCOG), c/o Melvin Johnson, 1836 10th Street, Los Osos, CA 93402. 805-528-2382
163-Slo Bytes IBM PC User's Group (SloBytes), c/o Bob Ward, 2100 Andre Avenue, Los Osos, CA 93402. 805-528-0121
322-Hi Desert Apple Computer Club, c/o Kevin Taunton, 5221 West Avenue L-12, Quartz Hills, CA 93536.
FOG – 69–Osborne Santa Barbara Users Group (OSBUG), c/o Santa Barbara Co Audit Fiscal, 205 Vernal, Santa Barbara, CA 93105. 805-687-8541
FOG – 42–Central Coast Computer Club (4C), c/o Burt L. Fielding, 325 Poppinga Way, Santa Maria, CA 93455. 805-937-1128
559-Atari Federation, P. O. Box 5367, Vandenburg AFB, CA 93437. 805-734-2451

CA 818

483-Pasadena Commodore Computer Club (PCCC), P.O.Box 1163, Arcadia, CA 91006. 818-447-2212
325-AUTOCAD Los Angeles Users Group, c/o Tesfaye Abagaz, P. O. Box 1243, Burbank, CA 91507. 818-843-5770
326-San Gabriel Valley TRS-80 Users Grp (SAGATUG), c/o Dan Dresselhaus, 837 East Alosta Avenue, Glendora, CA 91740.
FOG – 86–Osborne National Users Group (ONUG), P. O. Box 424, Northridge, CA 91328. 818-709-6202
FOG – 84–Osborne Komputer Owners Klub (OKOK), P. O. Box 40429, Pasadena, CA 91104-7429. 818-794-3243
324-Pasadena IBM Users Group, c/o Steve Bass, 711 East Walnut Street, Pasadena, CA 91101. 818-795-2300
FOG –106–Technical & User Groups Network (TUG-NET), P. O. Box 705, Van Nuys, CA 91408-0705. 818-763-5410
466-WordStar User Group of Los Angeles, c/o Ken Adler, 5900 Sepulveda Blvd., Suite 550, Van Nuys, CA 91411. 818-501-4798

CA 916

498-Sacramento FIG, c/o Tom Ghormley. 916-444-7775
327-Commodore O U G of Redding (COUGOR), 2776-A Helen Street, Redding, CA 96002. 916-222-1633
FOG – 61–Sacramento Osborne Group (SOG), P. O. Box 660787, Sacramento, CA 95866-0787. 916-482-8804

CO 303

501-Denver FIG, c/o Cliff King. 303-693-3413
FOG – 65–Boulder CP/M Computer U Group (BUG), c/o K. B. Earnshaw, 98 County Road 83, Boulder, CO 80302. 303-447-9113
FOG – 4–DOG Computer Club (DOG), c/o Charles F. Molling, Attorney a, 1050 Cedar, Broomfield, CO 80020. 303-690-6301
FOG –133–Colorado Springs Osborne Group (CSOG), c/o James R. Sheldon, 2412 Sturgis Road, Colorado Springs, CO 80909. 303-473-7647
328-Front Range 99'er Computer Club, P. O. Box 9572, Colorado Springs, CO 80932. 303-596-6938
FOG –115–Fort Collins Osborne Group (FTCOG), c/o Tom Noonan, 209 East Swallow, Fort Collins, CO 80525. 303-226-4156
561-North CO Commodore Users Group (Norcocom), c/o Andrew E. Arvola, 2138 1/2 10th ST RD, Greeley, CO 80631.
552-Apple Three User Group of Colorado, c/o Tom Glover, 12533 West Grand Drive, Morrison, CO 80465. 303-973-4008
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CT 203

502-Central Connecticut FIG, c/o Charles Krajewski. 203-344-9996
FOG – 40–Danbury Osborne Group (DOG), c/o Marc Cohen, 23 Crestview Drive, Brookfield, CT 06804. 203-775-1102
440-Nutmeg TI-99ers, c/o Janet Ryan, 10 Jolly Road, Ellington, CT 06029.
329-Appleshare, P. O. Box 200, Green Farms, CT 06436. 203-259-8513
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171-Connecticut Computer Society (CCS), P.O.Box 17-032, West Hartford, CT 06117. 203-233-4141

DC 202

420-Washington DC Area TI H U G, c/o Bruce John Forbes, P. O. Box 865, Springfield, VA 22150. 703-439-3541

DE 302

330-Delaware Valley Users Group, P. O. Box 6240 Stanton Branch, Wilmington, DE 19804.

FL 305

503-Orlando FIG, c/o Herman B. Gibson. 305-855-4790
504-Southeast Florida FIG, c/o John Forsberg. 305-252-0108
334-Atari Computer Club of Palm Beaches, c/o Jim Woodward, 605 SW First Court, Boynton Beach, FL 33435.
332-Miami PC User Group Inc, 2500 E Hallandale Beach Blvd #707, Hallandale, FL 33009. 305-457-7744
578-South Florida Commodore Users Group, c/o Marc McNulty, 7760 NW 50th St #401, Lauderhill, FL 33321. 305-741-3752
FOG – 20–Central Florida Osborne Group (CFLOG), c/o Kenneth A. Mowen, 158 Royal Palm Drive, Leesburg, FL 32748. 305-282-4316
87-Central Florida Computer Society (CFCS), P. O. Box 8019, Maitland, FL 32751. 305-862-1329
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134-Space Coast Apple Users' Group Inc, P. O. Box 2112, Merritt Island, FL 32952-2112. 305-452-8357
FOG – 26–Gold Coast Computer Group (GCCG), P. O. Box 661256, Miami, FL 33266-1256. 305-888-3154
129-Miami Individuals w/Commodore Equip (MICE), 11110 Bird Road, Miami, FL 33165. 305-221-7115
476-Miami Apple Users Group, P.O.Box 403428, Miami Beach, FL 33140.
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335-Stuart Area Commodore Club (STARCOM), P. O. Box 1446, Port Salerno, FL 33492.
336-Marin County TI 99/4A Users, c/o Paul Yorke, 1200 Starfish Lane, Stuart, FL 33494. 305-287-1760
FOG – 91–Ft. Lauderdale Computer Group (FLCG), c/o Stephen Matus, 8461 NW 31st Place, Sunrise, FL 33321. 305-748-7237
333-Space Coast PC Users Group (SCPCUG), P. O. Box 396, Titusville, FL 32781-0396. 305-269-7815
110-Adam Users Group, 4757 #B Sunny Palm Circle, West Palm Beach, FL 33415.

FL 813

505-Tampa Bay FIG, c/o Terry McNay. 813-725-1245
FOG – 46–Tampa Bay Osborne Group (TBOG), c/o David W. Hardiman, 464 West Overbrook Street, Belleair Bluffs, FL 33540. 813-584-4185
580-Pinellas Atari Computer Enthusiasts (PACE), c/o Joan Raia, 4663 60th Street North, Kenneth City, FL 33709. 813-527-5119
130-Pinellas IBM-PC Users Group, c/o Dick Shutt, 1331 Seagull, St. Petersburg, FL 33707. 813-347-5444

FL 904

FOG – 98–Jacksonville Osborne Users Group (JOUG), c/o Jacksonville Electric Authorit, 233 W. Duval Street, Jacksonville, FL 32201. 904-633-4920
104-Timex Sinclair Users Group, c/o Steve Berg, 6634 Oriole Avenue, Jacksonville, FL 32216. 904-737-1538
FOG – 10–Pensacola FL Osborne Group (PFOG), c/o James W. Greene, 6230 Vicksburg Drive, Pensacola, FL 32503. 904-476-8083
615-Blue Angel Atari Comp Enthusiasts (B.A.A.C.E.), c/o Luke Hanley, 2731 Semoran Drive, Pensacola, FL 32503.
FOG – 77–Tallahassee CP/M User Group (TCPMUG), c/o Spencer R. Lepley, 1655 Capital Circle S.E. # 12, Tallahassee, FL 32301. 904-878-4592

GA 404

FOG – 93–The Osborne Group of Atlanta (TOGA), c/o William Woollett, 2018 Bramblewood Drive N.E., Atlanta, GA 30329. 404-636-1480
338-Association of Small Computer Users (ASCU), P. O. Box 14151, Atlanta, GA 30324. 404-394-0732
339-Atlanta TI-99/4A Computer Users Grp, P. O. Box 19841, Atlanta, GA 30325. 404-231-0992
506-Atlanta FIG, c/o Nick Hennefent, Computone Systems, Atlanta, GA 30338. 404-393-3010
25-CSRA Computer Society, P. O. Box 284, Augusta, GA 30903. 404-798-5513
582-Kaypro Users Group of Atlanta (KUG Atlanta), c/o Tim Farley, P. O. Box 1561, Decatur, GA 3031-1561. 404-284-8593

HI 808

FOG –124–Hawaii Island Computor Assoc (HIFOG), c/o Shayne Enterprises, P.O. Box 895, Hilo, HI 96721-0895. 808-935-8678
340-Hawaii TRS80 Users Group, c/o Alan Krassner, 432 Poipu Drive, Honolulu, HI 96825.
571-Hawaii Sanyo Users Group, c/o John Spangler, 713 Ulumaika Loop, Honolulu, HI 96816. 808-734-2925

IA 319

513-Iowa City FIG, c/o Robert Benedict. 319-337-7853
341-NE Iowa Home Computer Users Group (NIHUG), c/o Paul Berg, 804 Olive Street, Cedar Falls, IA 50613.
FOG –102–Quad City All Computers Users Group (QC/ACUG), c/o Robert H. & Dolores Lay, 1005 Canterbury Court, Davenport, IA 52806. 319-386-3484
445-Iowa City Tandy Users Group (ICTUG), c/o John Green, P. O. Box 1494, Iowa City, IA 52244.
447-Waterloo Area Commodore Club, c/o Steven D. Olsen, R.R. 1 Box 72A, Shell Rock, IA 50670.

IA 515

514-Central Iowa FIG, c/o Roderick A. Eldridge. 515-294-5659
515-Fairfield FIG, c/o Gurdy Leete. 515-472-7077
FOG – 12–Midwest FOG (MWFOG), c/o Dale A. Thatcher, 8031 Garrison Road, Des Moines, IA 50322. 515-270-3503
567-Central Iowa 99/4A Users Group, c/o Bob Ryherd, Box 3043, Des Moines, IA 50316. 515-263-0796
342-North Iowa Commodore Enthusiasts (NICE), c/o Tim Berneman, 911 North VanBuren, Mason City, IA 50401. 515-424-2755

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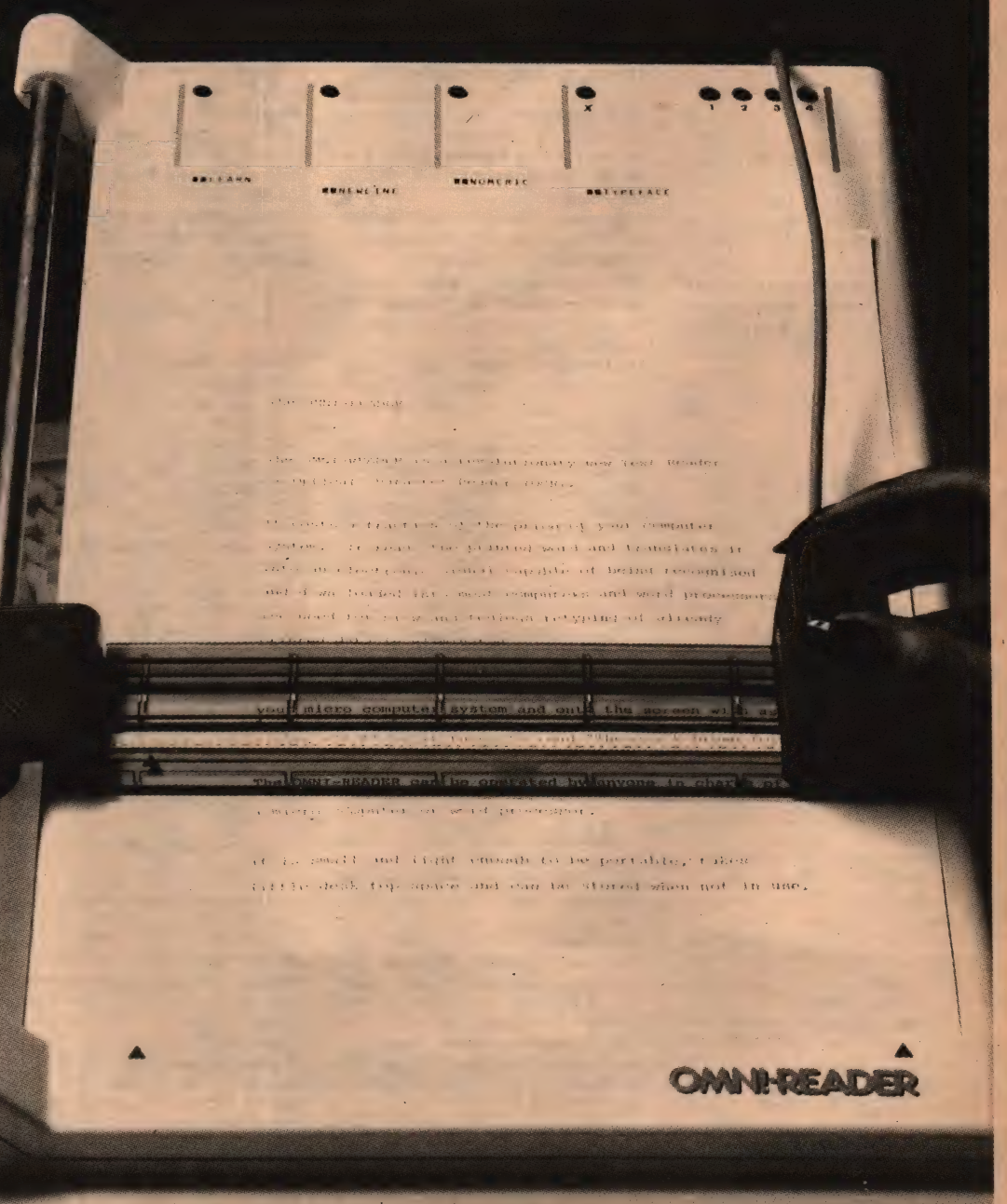

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IA 712

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ID 208

343-Boise 99ers Computer Club, c/o Jerry S. Hough, 6357 North Portsmouth Avenue, Boise, ID 83703.
570-MS-DOS Association, c/o Sherwood Hall, P. O. Box 8252, Moscow, ID 83843.
584-Idaho Tandy Users Group (ITUG), c/o Dr. Keith Davis, P. O. Box 609.CS, Shoshone, ID 83352.

IL 217

508-Central Illinois FIG, c/o Sidney Bowhill. 217-333-4150
344-Illiana Ace Atari Users Group, 3816 Pershing, Danville, IL 61832.
626-Decatur 99'er H.C.U.G., P. O. Box 726, Decatur, IL 62525. 217-877-1631
345-Jacksonville Area Commodore Users, P. O. Box 135, Murrayville, IL 62668.
346-Western Illinois Pet Users Group (WIPUG), c/o Edward L. Mills, Rte 5 Box 75, Quincy, IL 62301. 217-936-2497
194-Progressive Atari Computing (PAC), c/o Network: Atari, P.O. Box 196, Rantoul, IL 61866-0196.

IL 309

189-CIA User Group, P.O. Box 1462, Peoria, IL 61602. 309-676-2472
195-Sanyo & MS-DOS Users Group (SMUG), c/o Jim Brumm, 518 West Melborne, Peoria, IL 61604. 309-688-7988
4-Osborne Owners Peoria Society (OOPS), c/o Howard Morris, RD 2, Washington, IL 61571. 309-745-5034

IL 312

507-Cache FIG, c/o Clyde W. Phillips Jr.. 312-386-3147
509-Fox Valley FIG, c/o Samuel J. Cook. 312-879-3242
510-Rockwell Chicago FIG, c/o Gerard Kusiolek. 312-885-8092
FOG – 80–Chicago's First Osborne Group (CFOG), P. O. Box 1678, Chicago, IL 60690. 312-654-0986
188-Chicago Area Computer Hobbyist Exch (CACHE), 323 S. Franklin #804 Box C-176, Chicago, IL 60606-7092. 312-653-4114
350-Chicago Computer Society, P. O. Box 8681, Chicago, IL 60680-8681.
351-AVTAK – Amiga Users Group, 323 South Franklin Box P-225, Chicago, IL 60643.
353-Chicago Area TI 99/4A Users Group, P. O. Box 578341, Chicago, IL 60657. 312-738-7816
609-No. IL Computer Hobbyist Exchange (N.I.C.H.E.), P. O. Box 25013, Chicago, IL 60625-0013.
348-Macadamia, P. O. Box 333, Crystal Lake, IL 60014.
592-Fox Valley Pet (Commodore) User Grp (FVP(C)UG), c/o Herb Gross, 833 Prospect, Elgin, IL 60120. 312-695-1316
347-Clergy Computer Users Group, c/o Rev. John M. Heidengren, 222 Kenilworth Avenue, Kenilworth, IL 60043. 312-251-6120
197-TRS Computer Users SIG 80 Group, 6720 Palma Lane, Morton Grove, IL 60053.
352-Chicago Area Timex Users Group (CATUG), 210 Bernice, Northlake, IL 60164. 312-473-9415
349-Waukegan Apple Users Group, P. O. Box 8913, Waukegan, IL 60079.

IL 618

355-IBM Jr User Group, P. O. Box 8012, Alton, IL 62002.
193-Nationserv Users Group, P.O. Box 391, Fairfield, IL 62837. 618-847-2381
454-Gateway Computer Club, Box 1839, Fairview Heights, IL 62208.
354-Little Egypt Apple Users Group, P. O. Box 1122, Murphysboro, IL 62966.

IN 219

512-Fort Wayne FIG, c/o Blair MacDermid. 219-749-2042
201-Logansport Commodore Club, 2329 Myers Lane, Logansport, IN 46947. 219-753-9353
621-MA-KUG, c/o John Barker, 16453 Ireland Road, Mishawaka, IN 46544. 219-256-9988
359-Stueban County Commodore User Group (SCCUG), P. O. Box 25, Pleasant Lake, IN 46779. 219-475-5017

IN 317

511-Central Indiana FIG, c/o John Oglesby. 317-353-3929
FOG –126–Group I/Indianapolis Sm System Grp (GROUP-I), 6448 N. Ewing Street, Indianapolis, IN 46220. 317-875-7635
357-IBM PC Users Group Inc, P. O. Box 2532, Indianapolis, IN 46206. 317-897-5166
471-PC Desktop Publishing Users Troop (PC DEPUTY), c/o Ben Yanto, 5621 W. Liberty Ck. Dr., Indianapolis, IN 46254. 317-299-0440
569-Indy Apple Pickers, P. O. Box 20136, Indianapolis, IN 46220. 317-923-5825
573-Hoosier Users Group (TI-99/4A) (HUG), P. O. Box 2222, Indianapolis, IN 46206-2222. 317-631-7255
FOG – 34–Hoosier Osborne Group (HOG), c/o Peter Cook, 1903 East 430 South, Lafayette, IN 47905. 317-494-1914
568-Lafayette Apple Users Group (LAUG), c/o Ron Brand, 519 South 31st, Lafayette, IN 47901. 317-448-1020
200-Indiana Sinclair Timex Users Group, 513 East Main St., Peru, IN 46970. 317-473-4885
356-Miami Country Area TI 99/4A H U G, P. O. Box 1194, Peru, IN 46970. 317-472-3192

IN 812

FOG – 87–Indiana Osborne Group (IOU), c/o Charles C. Foster, 4041 East Bethel Lane, Bloomington, IN 47401. 812-334-3234
358-Evansville Kaypro Users Group, P. O. Box 4162, Evansville, IN 47712.

KS 316

516-Wichita FIG (FIGPAC), c/o Arne Flones. 316-267-8852
FOG –137–Hutchinson Computer Hobbyists (HUTCH), c/o Geo Holcomb Associates, P.O. Box 23, Hutchinson, KS 67504. 316-663-7678
FOG – 21–Osborne Portable Enthusiast of KS (OPEK), c/o Norm Conley, 2916 West 21st, Wichita, KS 67203. 316-832-0447
360-Commodore Users Group of Wichita, c/o Steve Lee, P. O. Box 593, Wichita, KS 67201-0593. 316-722-8044

KY 502

FOG – 64–Personal Computer Club - Louisville (PCCL), c/o David Creed, 1381 Tyler Park Drive, Louisville, KY 40204. 502-459-6127
205-Owensboro Microcomputer Users Group, 1841 Bonnie Castle Drive, Owensboro, KY 42301.

KY 606

FOG – 32–Kentucky Osborne Group (KOG), c/o Robert A. Gibson, 412 Bristol Road, Lexington, KY 40502. 606-269-1684
361-Central KY Computer Society Inc (CKCS), 1609 Richmond Road, Lexington, KY 40502. 606-266-7938
362-Bluegrass 99 Computer Society Inc, P. O. Box 11866, Lexington, KY 40578-1866.

LA 318

463-De Ridder Computer Club, c/o P.O.Box 1377, 212 W. Fourth St., De Ridder, LA 70634. 318-462-1753
363-Louisiana PC Users Group & Library, P. O. Box 4615, Lafayette, LA 70502-4615. 318-988-8611
627-Northeast Louisiana PC Users Group (NELA-PUG), c/o Mike Ravary, P. O. Box 7147, Monroe, LA 71211. 318-323-3710
565-Louisiana Atari Computer Enthusiast, 1605 North Hearne Ave Suite 125, Shreveport, LA 71107.

LA 504

517-New Orleans FIG, c/o Darryl C. Olivier. 504-899-8922
622-First Louisiana Osborne Group (FLOG), c/o Johnson Equipment Co., P. O. Box 1481, Baton Rouge, LA 70898-4181. 504-923-0888
364-Chalmette LA Atari Systems Society (CLASS), P. O. Box 1588, Chalmette, LA 70044-1588. 504-277-9701
562-Cajun Computer Club, c/o Gregory T. Herman, 216 Margaret Street, Houma, LA 70363. 504-879-1525
563-Serious Atari Interest of Louisiana (S.A.I.L.), c/o Gregory T. Herman, 407 Marmande Street, Houma, LA 70363. 504-868-1468
207-New Orleans Atari Users Group (NOAUG), P.O. Box 73236, Matairie, LA 70033. 504-738-3939

MA 617

518-Boston FIG, c/o Bob Demrow. 617-688-5661
FOG –122–Boston Osborne Group (BCS SIG) (BOG), c/o John J. DeMeritt, 32 Willow Street, Belmont, MA 02178. 617-484-1863
365-Commodore Users Group (BCS SIG), One Center Plaza, Boston, MA 02108. 617-367-8080
486-Wang PC/APC Users Group SIG of BCS, c/o Boston Computer Society, One Center Plaza, Boston, MA 02108. 617-367-8080
600-Atari Boston User Group (BCS SIG) (A-BUG), One Center Plaza, Boston, MA 02108. 617-367-8080
281-Mass Electronic Modem Operators (MEMO), c/o Kevin Cray, P.O. Box 3336, Fall River, MA 02722-3336. 617-673-5647
366-Acton-Boxboro Users Group, P. O. Box 1523, Westford, MA 01886.

MD 301

259-Baltimore Sanyo Users Group, c/o David H. Chase, 101 N. Williams Street, Bel Air, MD 21014. 301-879-2406
455-Ft Meade Color Computer Club, c/o Frank Powers, 12207 Mackai Lane, Bowie, MD 20715. 301-262-9573
369-Hagerstown Computer Club, c/o Dan Seiler, Rt 1, Box 290A, Clear Spring, MD 21722. 301-791-7039
FOG –101–Central MD Microcomputer User's Grp (CMMUG), c/o Paul Demmitt, 3999 Watchlight Court, Columbia, MD 21045. 301-997-3246
464-Chusy/Bug User Group, c/o Tom Vervaeke, 8945 Skyrock Court, Columbia, MD 21046. 301-381-5406
368-Baltimore Morrow Users' Group (BaltiMUG), c/o Tim Evans, 2201 Brookhaven Court, Fallston, MD 21047. 301-597-4709
367-Commodore User's Medium Baltimore (CUM-BACC), 1427 York Road at Seminary Ave, Lutherville, MD 21093-6014. 301-296-4414
560-Arundel Commodore Hardware User Grp (ACHUG), c/o Rich Sykes, 631 Cedar Drive, Pasadena, MD 21122. 301-437-9567

ME 207

370-Southern Aroostook Commodore U G, P. O. Box 451, Houlton, ME 04730.
FOG –136–Southern Maine Osborne-CP/M Users G (SMOG), c/o Mason Philip Smith-Photography, P.O. Box 1020, Portland, ME 04104. 207-772-1616

MI 313

519-Detroit FIG, c/o Tom Chrapkiewicz. 313-562-8506
FOG – 37–The O Group of Ann Arbor (TOGA2), c/o Philip R. Yant, 3412 Oakwood, Ann Arbor, MI 48104. 313-764-4413
564-Genesee Atari Group (GAG), c/o Jerry Cross, G-3426 Branch Rd., Flint, MI 48506. 313-736-4544
371-Michigan Atari Computer Enthusiasts (MACE), P. O. Box 2785, Southfield, MI 48037.
FOG – 14–DEtroit FOG (DEFOG), c/o John L. Fallu, 22101 Old Forge Court, Woodhaven, MI 48183. 313-671-5562

MI 517

372-CHAOS, P. O. Box 16132, Lansing, MI 48901.

MN

624-Twin Cities Atari Interest Group, c/o Steven Ingalsbe, 4309 Sun Cliff Road, Eagan, MN 55122.

MN 218

FOG –118–Duluth Superior Ozzies (DSO), c/o Sanders J. Sweeney, 201 City Hall, Duluth, MN 55802. 218-626-3344
477-Ultimate Pirate Guild, c/o Mark Steiger, 523 Aspen Grove, Hibbing, MN 55746-3870.
478-Micro-Pirates of Virginia, c/o Jeremy, 302 8th St. S, Apt# 203, Virginia, MN 55792.

MN 612

520-Minnesota FIG, c/o Fred Olson. 612-588-9532
FOG –111–Twin Cities Osborne Group (TCOG), P. O. Box 2163 Loop Station, Minneapolis, MN 55402. 612-871-6076
284-MSP 99 Users Group, P.O. Box 12351, St. Paul, MN 55112. 612-533-8494

MO 314

286-Columbia Apple User Group, P.O. Box 811, Columbia, MO 65205.
588-Columbia PC Users Group, c/o Mike Glascock 223 Research Rea, University of MO, Columbia, MO 65211. 314-882-4211
522-St. Louis FIG, c/o Robert Washman, 91 Weis Drive, Ellisville, MO 63011.
FOG – 55–Gateway CP/M Users Group (GatewayCP/M), P. O. Box 37022, St. Louis, MO 63141-1522. 314-991-4399

MO 816

287-The KC South Computer Club, c/o Bill Baker, 2419 Queen Ridge Drive, Independence, MO 64055. 816-252-3616
375-KC ACE, P. O. Box 5286, Kansas City, MO 64112.
FOG – 97–Mizouri Osborne Group (MIZOG), c/o Floyd Bartley, 7400 Hadley, Overland Park, KS 66204. 913-722-3349
374-Sedalia C-64 Users Group, c/o Nick Coble, Rt 4 Box 186BB, Sedalia, MO 65301.
373-Commodore User Group of Warrensburg (CUGW), P. O. Box 893, Warrensburg, MO 64093.

MO 913

521-Kansas City FIG, c/o Linus Orth. 913-236-9189

MS 601

376-Gulfport Tandy 1000 Users, c/o Shari McMahon, 2504 East Birch Drive, Gulfport, MS 39503.
577-HUB Computer Users Group (HCUG), P. O. Box 1741, Hattiesburg, MS 39401.
FOG – 58–Mississippi Computer Society (MCS), P. O. Box 16417, Jackson, MS 39236-0417. 601-856-2509
377-The DOS Realm, c/o Richard Hudson, 139 Dorchester Court, Jackson, MS 39208.

MT 406

378-Grizzly Hackers, c/o Les Dimich, P. O. Box 1179, Red Lodge, MT 59068.

NC 704

380-Asheville-Buncombe Users Group, P. O. Box 15578, Asheville, NC 28813.
FOG – 71–Local Osborne Group Including CP/M (LOGIC), c/o Barbara Webster, 1841 Kenwood Avenue, Charlotte, NC 28205. 704-377-1154
223-Charlotte Atari-Users Group (CAUG), c/o Jim Andrews, 7210 Lakeside Drive North, Charlotte, NC 28215. 704-568-5099
595-Charlotte TI99 Users Group, 3454 Washburn Avenu, Charlotte, NC 28205-7027. 704-334-8302
379-Cleveland/Gaston Commodore User Grp, P. O. Box 2512, Shelby, NC 28151.

NC 919

FOG –107–Triad Region O Group Including CP/M (TROGIC), c/o Bill Morgan, 520 Merry Brook Court, Clemmons, NC 27012. 919-766-5530
381-Quantum Engineering Apple UG, 3014 Ravenhill Drive, Fayetteville, NC 28303. 919-323-5950
438-Raleigh Area Group Epson (RAGE), c/o Julie Sauvageot, 103 York Court, Garner, NC 27529. 919-772-8683
382-Triangle Adam Users, 2623-A Yanceyville Street, Greensboro, NC 27405-4407. 919-375-6159
FOG – 8–Raleigh Other Computer Club (ROCC), c/o Michael Rulison, 3256 Lewis Farm Road, Raleigh, NC 27607-6723. 919-782-9576
135-Triangle dBASE Users Group, c/o Dr. Richard W. Slatta, 3304 Dell Drive, Raleigh, NC 27609-7118. 919-781-3181

ND 701

FOG –117–Osborne/Kaypro User's Group (O/KUG), P. O. Box 1372, Fargo, ND 58107. 701-282-5359
451-Northland Hackers Commodore U G, 1386 A Beech Avenue, Grand Forks AFB, ND 58205.
482-Minn. and Dakota Home Users Group (MAD HUG), 509 Reeves Drive, Grand Forks, ND 58201.

NE 308

581-Mid-Nebraska Users of Commodores, c/o Fred Roeser, 1920 North Huston, Grand Island, NE 68803. 308-384-2154

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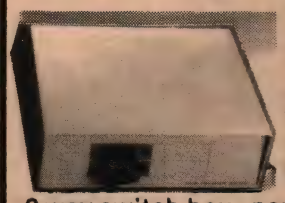

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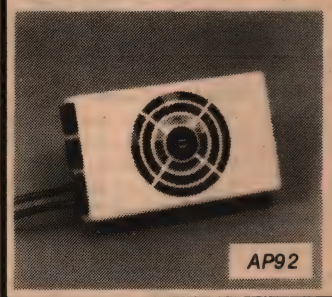

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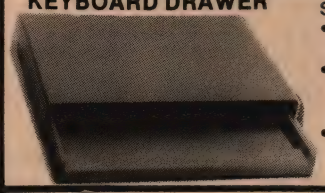

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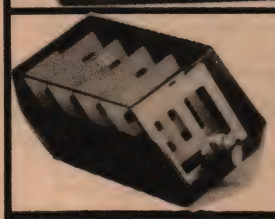

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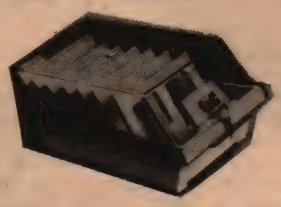

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Users Groups

NE 402

FOG – 39–Lincoln Local O Group (Lincoln LOG), c/o Agri-Engineering, 918 First Street, Milford, NE 68405. 402-761-3393
383-Amiga Users of the Heartlands, c/o Fred Layberger, P. O. Box 1432 DTS, Omaha, NE 68101.

NH 603

524-New Hampshire FIG, c/o M. Peschke. 603-774-7762
384-NH Atari Computer Club, c/o Scott Mitchell, 561 Wentworth Street, Manchester, NH 03102.

NJ 201

583-Morris Area Commodore Users Group (MACUG), c/o Jim Agnew, 512 Hardwick Street, Belvidere, NJ 07823. 201-475-4845
453-North Jersey TI Users Group, c/o Karl Barna, 21 Morse Ave, Butler, NJ 07405.
385-Midi Apple Users Group, c/o Telesat International, P. O. Box 2334, Elizabeth, NJ 07207-2334. 201-352-2319
293-Jersey Atari Computer Group (JACE), 8 Crescent Road, Pine Brook, NJ 07058. 201-534-6349
386-Garden State Commodore User Grp Inc, 86 Stratford Road, Tinton Falls, NJ 07724. 201-542-2113
625-Enjoyers in New Jersey of Amigas (ENJA), P. O. Box 43021, Upper Montclair, NJ 07043. 201-893-5269
FOG –138–Jersey Osborne Group (JOG), P. O. Box 464, Westfield, NJ 07091-0464. 201-233-0202

NJ 609

387-Central State TI Users Group, c/o B. Kafer, P. O. Box 305, Roebling, NJ 08554.
616-Computer Club of Ocean County (CCOC), c/o Mike Marotta, P. O. Box 744, Toms River, NJ 08754. 609-693-9575
388-Cape PC Users Group, c/o Gene Neill, 131 West Heather Road, Wildwood Crest, NJ 08260.

NM 505

525-Albuquerque FIG, c/o Jon Bryan. 505-298-3292
FOG –127–Albuquerque Osborne Group (AGOG), c/o John W. Colburn, 1734 Solano Drive NE, Albuquerque, NM 87110. 505-268-3606

NV 702

523-Southern Nevada FIG, c/o Gerald Hasty. 702-452-3368
FOG – 25–Vegas Osborne Group (VOG), c/o Delbert L. (Willie) Mays, 1960 Miner Way, Las Vegas, NV 89104. 702-452-2544
86-Las Vegas Kaypro Users Group, c/o Paperwork Unlimited, 3600 Swenson Street, Las Vegas, NV 89109. 702-737-6520
473-Timex/Sinclair User Gp of Las Vegas, 2405 Howard Drive, Las Vegas, NV 89104. 702-386-3054

NY 212

526-FIG, New York, c/o Ron Martinez. 212-517-9429
FOG –135–New York Osborne Users' Group (NYOUG), P. O. Box 20435, Midtown Station, New York, NY 10129. 201-791-7444
470-New York Personal Computer Inc. (NYPC), 80 Wall Street, Suite 614, New York, NY 10005. 212-533-6972
475-New York Workbench User Group, c/o Applied Business Technology Co, 365 Broadway, 6th Floor, New York, NY 10013. 212-219-8945
479-Metro Tandy Computer Users Group, c/o George Mueden, 310 West 106 Street - 15D, New York, NY 10025. 212-222-8751
480-N.Y. Lap Users Group (NY LUG100), c/o Sarah Stambler, 370 Central Park West - #210, New York, NY 10025. 212-222-1713

NY 315

529-Syracuse FIG, c/o Henry J. Fay. 315-446-4600
389-Students & Teachers Computer UG, c/o Nick Dudish, Gros Blvd, Herkimer, NY 13350.
FOG – 82–Syracuse Osborne User's grouP (SOUP), c/o Gobind Singh Khalsa, 8371 Redwing Drive, Liverpool, NY 13090. 315-622-9209
449-Central New York Commodore Users Gp (CNYCUG), c/o Sid Chong, 6887 Peck Road, Syracuse, NY 13209. 315-638-2378
472-Atari Comp Enthusiasts of Syracuse (ACE of Syracuse), c/o Vernon W. Smith, 101 Clarke Street, Syracuse, NY 13210. 315-474-0450

NY 516

390-QB-99'ers User Group, c/o Frank Cotty, Queensborough Community College, Bayside, NY 11364.
579-Long Island Sinclair Timex Group (LIST), P. O. Box 438, Centerport, NY 11721-0438.
604-Long Island Computer Association (L.I.C.A.), c/o Lenny Printz, P. O. Box 71, Hicksville, NY 11802. 516-379-8743
628-Titex, c/o Jay S. Leber, 36 Fox Place, Hicksville, NY 11801. 516-796-8359
FOG – 88–Long Island Osborne Network (LION), c/o Merit Machinery Corp., P.O. Box 190, Oceanside, NY 11572. 516-781-2888
391-Suffolk Apple Computer Club, P. O. Box 349, Smithtown, NY 11787. 516-360-0797

NY 518

392-Tri City Commodore User's Group (TCCUG), P. O. Box 12742, Albany, NY 12212-2742. 518-456-5721

NY 607

217-Sinclair Computer Users Society (SINCUS), c/o Paul Hill, 1229 Rhodes Road, Johnson City, NY 13790.
393-Leatherstocking Commodore User's Cl, P. O. Box 1284, Oneonta, NY 13820.
219-TWIN Tiers Users Group, c/o Rose J. Sass, Rock Stream, NY 14878.

NY 716

527-Rochester FIG, c/o Thea Martin. 716-235-0168

NY 716

527-Rochester FIG, c/o Thea Martin. 716-235-0168
FOG –129–NIAgara FRontier Osborne Group (NIAFROG), c/o Robert W. Spencer, 238 Sterling Avenue, Buffalo, NY 14216. 716-838-6893
394-Buffalos Adam Enterprise, 162 Kennedy Road, Buffalo, NY 14227.
603-Western New York Atari User Group (W.N.Y.A.U.G.), c/o Richard Milazzo, P. O. Box 59, Buffalo, NY 14216. 716-874-4421
395-Atari Computer Owners of Rochester (ACORN), P. O.Box 855, Fairport, NY 14450. 716-334-5820
FOG –132–First Rochester Osborne Group (FROG), c/o James T. McCollum, Attorney, 321 Executive Office Bldg, Rochester, NY 14614. 716-232-7272

NY 718

396-Brooklyn Commodore Users Group, c/o Malcolm Jay Gottesman, 1735 East 13 St Apt 7N, Brooklyn, NY 11229.
397-Sheepshead Bay Computer Group, 2546 East 24th Street, Brooklyn, NY 11235.
481-New York Timex-Sinclair Enthusiasts (NYTSE), c/o Stoney McMurray, 473 Westminster Rd, Brooklyn, NY 11218-6037. 718-469-5948

NY 914

528-Rockland County FIG, c/o Elizabeth Gormley. 914-735-8967
FOG –104–Westchester Osborne Group (WOG), c/o Alfred Stamm, 33 Stratton Road, Scarsdale, NY 10583. 914-725-1098
398-Central Westchester 99'ers, 1261 Williams Drive, Shrub Oak, NY 10588.

OH 216

530-Akron FIG, c/o Thomas Franks. 216-336-3167
532-Cleveland FIG, c/o Gary Bergstrom. 216-247-2492
FOG – 75–Cleveland Osborne Group (COG), c/o Peter S. Tippett, 2135 Renrock, Cleveland Heights, OH 44118. 216-888-2078
400-Cleveland Sinclair Users Group, c/o Thomas Simon, 615 School Avenue, Cuyahoga Falls, OH 44221.
229-Northern Ohio Business Users Group (NOBUG), 571 East 185th St., Euclid, OH 44119. 216-944-5800
290-The Northcoast 99ers, P.O. Box 23283, Euclid, OH 44123-0283. 216-357-7274
FOG – 44–AKCAN Osborne Users Group (AKCAN), c/o Jean Powell PA, 1525 Orrville Street NW, Massillon, OH 44646. 216-837-8926
399-Basic Bits Commodore Group, c/o Michael Kelley, 5564 Wallace Blvd, No Ridgeville, OH 44039.
FOG – 9–Oberlin Osborne /Ob/Os (/Ob/Os), c/o Art Ripley, Box 5A OCMR, Oberlin, OH 44074. 216-775-8706
599-Cleveland Area 99/4A Users Group, c/o Deanna Sheridan, 20311 lake Road, Rocky River, OH 44116. 216-274-2544

OH 513

533-Cincinatti FIG, c/o Douglas Bennett. 513-831-0142
FOG – 27–Cincinnati Osborne Group (COG), c/o Terradise Computer Systems, 6404 Coffey Street, Cincinnati, OH 45230. 513-232-4076
226-Cincinnati's Tandy Users Group (CINTUG), P.O. Box 399145, Cincinnati, OH 45239. 513-525-0723
FOG – 79–Dayton Osborne Group (DOUG), c/o Dayton Pro Photo, Box 534, Dayton, OH 45419. 513-293-9061
401-Dayton Microcomputer Assoc, Inc, c/o Dayton Museum of Natural Histo, 2629 Ridge Avenue, Dayton, OH 45414-5499. 513-252-1230
534-Dayton FIG, c/o Gary M. Granger, Dayton, OH. 513-849-1483
402-Cincinnati Commodore Computer Club, c/o Wally Jones, P. O. Box 450, Owensville, OH 45160. 513-732-6572

OH 614

531-Athens FIG, c/o Isrea Urieli. 614-594-3731
403-Commodore Comp. Club of Lancaster (CCCL), c/o Paul Steinschreiber, P. O. Box 206, Amanda, OH 43102. 614-969-2086

OK 405

FOG – 67–OKlahoma CP/M Users' Group (OKCPM), c/o William S. Cooter, 1809 Vanessa Drive, Norman, OK 73071. 405-360-2141
233-Tinker Atari Computer Enthusiasts (TACE), P.O. Box 19456, Oklahoma City, OK 73144. 405-387-5649
535-Central Oklahoma FIG, c/o Larry Somers, Health Tech Bldg, 2410 NW 49th, Oklahoma City, OK 73112.
557-IBM & Commodore Software Trading, 1400 Hickory, Weatherford, OK 73096.

OK 918

FOG – 51–Osborne Users of Tulsa (OUT), c/o James R. Roop, 1632 S. Denver, Tulsa, OK 74119-4233. 918-587-3918
232-Green Country Computer Association, P.O. Box 497, Tulsa, OK 74101-0497. 918-245-6217
441-Tulsa Computer Society, P. O. Box 3211, Tulsa, OK 74101.
442-Tulsa Area Sysops Council, P. O. Box 580665, Tulsa, OK 74158. 918-585-2552

ONTA 416

484-Nine T Nine Users Group (Toronto) (9T9 (Toronto)), 29 Ingleside Drive, Downsview, ONTARIO M3K 1V2, CANADA. 416-633-1451

OR 503

536-Greater Oregon FIG, c/o Tom Almy, Beaverton, OR. 503-692-2811
FOG – 57–Portland Micro Computer Society (PMS), c/o Educational Research Associate, 333 SW Park Avenue 4th Floor, Portland, OR 97205-3784. 503-228-6345
FOG –128–Lane Osborne CP/M Users Group (LOCUG), c/o The Hardware Head, 1404 Centennial Blvd., Springfield, OR 97477. 503-747-8242

PA 215

556-SNUG Philadelphia, c/o Bill Serody, 1181 Cumberland Road, Abington, PA 19001. 215-887-0513
474-Clifton Heights Users Group (C.H.U.G.), P.O.Box 235, Clifton Heights, PA 19018.
FOG –121–Philadelphia Region O Group (PhROG), P. O. Box 1144, Paoli, PA 19301. 215-648-5862
404-Philadelphia Heath Users' Group, P. O. Box 18148, Philadelphia, PA 19116-0148.
537-Philadelphia FIG, c/o Melanie Hoag or Simon Edkins, Philadelphia, PA. 215-895-2628

PA 412

FOG – 50–Three Rivers Osborne Group (TROG, PA), P. O. Box 23152, 4th Ave. Station, Pittsburgh, PA 15222. 412-661-2446
460-Computers and Learning, c/o Donna Vargo (CAL), P.O.Box 343, Valencia, PA 16056.

PA 717

235-APPCOM, RD1 Box 83-1/2, Dornsife, PA 17823.
406-Southcentral PA Atari Comp Enthusia (SPACE), P. O. Box 11446, Harrisburg, PA 17108-1446. 717-657-3335
407-Central PA TI-99/4A Users Group, P. O. Box 14126, Harrisburg, PA 17104-0126. 717-657-4992
618-Harrisburg PC User Group, c/o Jack Stahl, 1195 Fairmont Drive, Harrisburg, PA 17112. 717-652-9097
587-Hazleton Area Atari User's Group (HAUG), P. O. Box 506, Hazleton, PA 18201.
FOG – 74–Lancaster Micro-Users Group (L-MUG), c/o Allen H. Eshleman, 3624 Horizon Drive, Lancaster, PA 17601. 717-285-4940
FOG – 92–Mid-Pennsylvania Osborne Group (MidPOG), P. O. Box 287, Lemoyne, PA 17043. 717-763-7064
241-S.A.G.E. of NE PA Atari Users Group (S.A.G.E.), 204 Sanderson Ave., Olyphant, PA 18477-2033.
405-Cumberland Valley Apple Users Group (CVAUG), c/o James R. Lucid, 11480 Pine Hill Drive, Waynesboro, PA 17268-9357. 717-762-4806
242-The York Area 99ers Users Group, P.O. Box 7160, York, PA 17404. 717-993-6514

PA 814

239-North American Amiga Users Group (NAAUG), c/o Richard Shoemaker, P.O. Box 376, Lemont, PA 16851. 814-237-5511
240-Nittany Users of Texas Instruments (NUTI), 625 Wiltshire Drive, State College, PA 16803. 814-238-0396

RI 401

591-North Eastern 99'ers, 76 Herschel Street, Providence, RI 02909. 401-331-6342

SC 803

452-Upstate SANYO Users, c/o Paul Gruver, P.O.Box 767, Pickens, SC 29671.
408-Spartanburg Commodore Users Group (SPARCUG), P. O. Box 319, Spartanburg, SC 29322.

SD 605

467-Siouxland 99ers, 4604 Bluestem Circle, Sioux Falls, SD 57106.

TN 615

409-Par I PC User Support Group, P. O. Box 681, Knoxville, TN 37901.
FOG –119–Nashville CP/M Users Group (NCP/MUG), P. O. Box 24606, Nashville, TN 37202-4606. 615-361-4210
608-Nashville Commodore Users Group, c/o Carl Manka, P. O. Box 121282, Nashville, TN 37212. 615-889-8749
FOG – 13–Smoky Mountain Osborne Group (SMOG), P. O. Box 171, Oak Ridge, TN 37831-0171. 615-483-6857
538-East Tennessee FIG, c/o Richard Secrist, Oak Ridge, TN. 615-483-7242

TN 901

410-Mid-South TI-99/4A Users Group, P. O. Box 38522, Germantown, TN 38183-0522. 901-358-0667
FOG – 15–Memphis Osborne Group (MOG), c/o Isaac L. Kullman, 2753 Woodland Hills Cove, Memphis, TN 38127. 901-358-8128
411-Commodore Assoc of the Mid South, c/o Steven C Peyrot, 3318 Keystone Avenue, Memphis, TN 38128. 901-357-8576

TX 214

250-Dallas TI Home Computer Group, P. O. Box 29863, Dallas, TX 75061. 214-579-7822
540-Dallas/Ft Worth FIG, c/o Check Durrett, Dallas, TX. 214-245-1064
412-128 Users of Dallas/Ft Worth, 1913 Dalworth Street, Grand Prairie, TX 75050.
413-Paris 99/4A Users Group, c/o Jerry Keisler, 2221 College Drive, Paris, TX 75460.
71-Metroplex CP/M Interest Group Inc (MCPMIG), P. O. Box 863909, Plano, TX 75086. 214-261-0577

TX 409

FOG – 41–Local Osborne Group (LOG), c/o Gary Teaney, 2680 Long, Beaumont, TX 77702. 409-832-8369
FOG – 43–AGGi Non-profit Osborne Group (AGGNOG), c/o Roger Laine, Petroleum Engineering Dept. TAMU,

Users Groups

College Station, TX 77843. 409-846-7483

TX 512

FOG – 7–A E I O U (AEIOU), P. O. Box 1413, Austin, TX 78767-1413. 512-836-3010
248-Austin Atari Computer Enthusiasts (AACE), 8207 Briarwood Lane, Austin, TX 78758. 512-321-7640
539-Austin FIG, c/o Matt lawrence, P. O. Box 180409, Austin, TX 78717.
414-South Texas Macintosh User's Group (ST. MUG), P. O. Box 3058, Corpus Christi, TX 78404.
415-Corpus Christi 99ers Users' Group, 534 Vaky Street, Corpus Christi, TX 78404.
416-San Antonio Sanyo Users Group, 3438 No. Saint Mary's, San Antonio, TX 78212. 512-736-9099

TX 713

FOG – 76–Osborne Users Club, Houston (OUCH), c/o Bruce Wilson, 10510 Tradewinds, Houston, TX 77086. 713-931-1096
541-Houston FIG, c/o Dr. Joseph Baldwin, Houston, TX. 713-749-2120
417-Commodore Houston Users Group, P. O. Box 612, Tomball, TX 77375. 713-995-5449
FOG –108–CLOG (CLOG), P. O. Box 57613, Webster, TX 77598. 713-482-7877

TX 806

FOG – 28–Panhandle Osborne Group (POG), c/o Robert O. McNeil, 3028 N.E. 26th, Amarillo, TX 79107. 806-355-7509
566-Quantum Leap User Group (QLUG), c/o Gale Henslee, 4411 West 2nd Avenue, Amarillo, TX 79106.
FOG –134–Lubbock Osborne Group (LOG), c/o School of Law, Texas Tech University, Lubbock, TX 79409. 806-742-3920

TX 817

123-Tarrant County Osborne Group (TCOG), c/o Marc McCauley, 3910 El Campo, Fort Worth, TX 76107-4407. 817-332-7027

TX 915

542-Periman Basin FIG, c/o Carl Bryson, Odessa, TX. 915-337-8994

UT 801

FOG –105–Salt Lake Metropolitan O Group (SMOG), c/o William Adams, 760 - 3 Fountains Drive #106, Murray, UT 84107. 801-268-2831
418-ST National Users Group (ASTUN), 6157 South 700 West, Murray, UT 84123.
543-North Orem FIG, c/o Ron Tanner, 748 North 1340 West, Orem, UT 84057.

VA 703

546-Potomac FIG, c/o Joel Shprentz, Arlington, VA. 703-860-9260
590-Software Exchange Systems, c/o Steven Mikutel, VA Tech, 4058 Each Pritchard Hall, Blacksburg, VA 24061. 703-552-1593
446-National Capital Tandy Computer UG (NCTCUG), c/o Karl Hessinger, P. O.Box 2826, Fairfax, VA 22031.
107-NOrthern VirginA users group (NOVA OUG), c/o Robert L. Crites, 7512 Fairwood Lane, Falls Church, VA 22046. 703-560-5117
575-Northern Virginia Apple Users Group, P. O. Box 8211, Falls Church, VA 22041. 301-899-4005
419-Rappahanock Apple Group (RAG), c/o Joe McAllister, 6014 Battlefield Green Drive, Fredericksburg, VA 22401. 703-786-6577

VA 804

545-First Forth of Hampton Roads, c/o William Edmonds, Hampton Roads, VA. 804-898-4099
551-Apple Three Group International (ATGI), c/o H. Joseph Dobrowolski, P. O. box 913, Langley AFB, VA 23665. 804-865-7520
558-Old Dominion 99'ers User Group, c/o Daniel O. Deagle, 5805 Signal Hill Road Apt 6B, Mechanicsville, VA 23111.
421-Peninsula Apple Core, P. O. Box 6384, Newport News, VA 23602.
612-Tidewater 99/4 User Group Inc, 51 Gainsborough Place, Newport News, VA 23602.
FOG – 52–Central Virgina O G (CVOG), c/o Theodore B. Smith, 9206 Mapleway Road, Richmond, VA 23229. 804-740-5718
547-Richmond Forth Group, c/o Donald A. Full, Richmond, VA. 804-739-3623
619-Richmond Kaypro Users Group (RKUG), c/o Wayne Anderson, P. O. Box 3892, Richmond, VA 23235. 804-744-6464
FOG – 78–Tidewater Osborne Group (TOG), c/o William B. Stilley, P.O. Box 68068, Virginia Beach, VA 23455. 804-497-5556

VI 809

FOG – 70–St. Croix Osborne Users Group (ST. COUG), c/o Photo-Ready Printing Inc., P. O. Box 2610 - Christiansted, St. Croix, VI 00820. 809-778-6651
423-Caribbean Commodore Computer Club, P. O. Box 4680, St. Thomas, VI 00801.

VT 802

60-VNHOG Computer Group (VNHOG), c/o Penquin Peripherals, 5 Hillcrest Road, Rutland, VE 05701-2528. 617-524-4834
544-Vermont SIG, c/o Don VanSyckel, Vergennes, VT. 802-388-6698

WA 206

596-Bellevue/Redmond Atari Comp Enthus. (B.R.A.C.E.), c/o Tom Tjarnberg, P. O. Box 6341, Bellevue, WA 98008-0341. 206-525-8060
597-Kitsap Country Atari Comp Entusiast (KC-ACE), c/o Roy Smith, 5553 Ocean View Blvd NE, Bremerton, WA 98310. 206-377-2523
422-Puget Sound 99ers, P. O. Box 6073, Lynnwood, WA 98036. 206-745-3249
FOG – 99--South King county Operators Group (SKOG), c/o Carl B. Tenning, 316 S. 193rd, Seattle, WA 98148. 206-824-3843
FOG –112–Osborne Executive User's Group (OEUG), c/o Tim Mayhew, P. O. Box 12214, Seattle, WA 98102. 206-232-2763
263-Starbase - An Official Atari U.G., c/o Steve Drake, 8307 27th NW, Seattle, WA 98117. 206-745-2867
264-Telecommunications Users Group, P.O. Box 45254, Seattle, WA 98145-0254. 206-763-7733
FOG – 72–Tacoma Open Group for microcomputer (TOG), c/o Robert J. Thomson, 1808 Lenore Drive, Tacoma, WA 98406. 206-752-5582
598-Seattle-Puget Sound Atari Comp Ent. (S*P*A*C*E), c/o Dave Showalter, P. O. Box 110576, Tacoma, WA 98411-0576. 206-824-5141
265-Vashon Island Sinclair-Timex Assoc. (V.I.S.T.A.), P.O. Box 199, Vashon Island, WA 98070.

WA 509

FOG –123–Spokane Microcomputer Users Group (SMUG), c/o Rings & Things, P. O. Box 1753, Spokane, WA 99210-1753. 509-922-1346
FOG – 19–Three Rivers Osborne Group (WA) (TROG, WA.), c/o Allen B. Webb, 743 North 61st Avenue, West Richland, WA 99352. 509-967-2430

WI 414

424-Fox Cities Users' Group, P. O. Box 2553, Appleton, WI 54913-2553.
FOG – 22–MILWaukee Osborne Group (MILWOG), c/o Ken Biggers, West 170 North 11449 Armada Drive, Germantown, WI 53022. 414-255-0440
549-Milwaukee Area FIG, c/o Donald H. Kimes, Milwaukee, WI. 414-377-0708
576-Color Computer-Milwaukee User Group (CoCo-Mug), c/o Johnn Dais, 3784 North 73rd Street, Milwaukee, WI 53216.
459-Sheboygan Area 99ers User Group, P.O.Box 1151, Sheboygan, WI 53082-1151.
425-Milwaukee Area Atari Users Club, P. O.Box 19858, West Allis, WI 53219-0858. 414-354-1717

WI 608

426-Adam & Eve Apple Users' Group, P. O. Box 5344, Madison, WI 53705.
427-Commodore Amiga Madison & Environs (CAMEO), Box 30, Union South, 227 N Randall, Madison, WI 53706. 608-233-7445
550-MAD Apple FIG, c/o Bill Horzon, 129 South Yellowstone, Madison, WI 53705.

WI 715

593-Menomonie Area Commodore Users Grp, c/o Mike Williams, 510 12th Street, Menomonie, WI 54701. 715-235-4987
548-Lake Superior FIG, c/o Allen Anway, Superior, WI. 715-394-8360

WV 304

586-Amiga Business Users Group (ABUG), c/o Greg Reed, Rt. 2 Box 76-C, Beckley, WV 25801. 304-255-0895
FOG – 59–Kanawha Valley FOG (Valley FOG), c/o Building A, Apt. #5, 3361 Route 60 East, Huntington, WV 25705. 304-727-8716

WY 307

273-Adamland International Computers UG, 795 Garfield, Lander, WY 82520.
428-Midlands Apple Users Group, P. O. Box 1204, Torrington, WY 82240-1204.

CANADA

FOG – 94–Calgary Osborne Users Group (COUG), c/o W. Greg King, 24 Edgedale Way NW, Calgary, ALTA T3A 2P8, CANADA. 403-239-5685
FOG – 45–Klondike Osborne Group (KOG), c/o Compass, 20 Marion Drive, Sherwood Park, ALTA T8A 0M1, CANADA. 403-464-5088
555-Apples Brit Col Computer Society, c/o David James, P. O. Box 80569, Burnaby, B.C. v5h 3x9, CANADA. 604-291-1005
FOG – 17–Vancouver Portable Computer Club (VPCC), P. O. Box 80621, Burnby, B.C. V5H 3Y1, CANADA. 604-298-6990
24-Muddy Waters Osborne Group (MWOG), Box 155A R. R. #5, Winnipeg, MAN. R2C 2Z2, CANADA. 204-224-3513
429-Manitoba Users Group (MUG), Box 8, Group 351, RR 3, Winnipeg, MANI R3C 2E7, CANADA.
487-Winnepeg 99/4 Users' Group, c/o Paul Degner, 1105 Church Avenue, Winnipeg, MANI R2X 1G1, CANADA. 204-586-6889
FOG –120–Osborne Users Club of Toronto (OUCT), c/o Walter Weary, 105 Galley Avenue, Toronto, ONT. M6R 1H2, CANADA. 416-533-1531
430-Toronto Timex-Sinclair Users Group, P. O. Box 7274 Station A, Toronto, ONT. M5W 1X9, CANADA.
602-TI Users Group Toronto (99T), c/o Steve Mickelson, 15 Kersdale Avenue, Toronto, ONT.
FOG – 95–London Osborne Group (LOG), c/o Jack Lorimer, 1625 Hillside Drive, London, ONT. N6G 2R1, CANADA. 519-434-1944
431-Sudbury 99ers, c/o Jim McLaren, Site 1 Box 7, Whitefish, ONT. P0M 3E0, CANADA.
FOG – 73–Montreal O & CP/M Users Group (MICROCOZM), c/o Gerald P. Barry, 3463 Ste Famille Apt. 1010, Montreal, P.Q. H2X 2K7, CANADA. 514-932-4164
432-Saskatoon TI Computer Club, P. O. Box 9556, Saskatoon, SASK S7K 7G1, CANADA.

Australia

FOG –131–Victorian Osborne Users Group (VOUG), c/o Charles Sandercock, 7 Illawarra Road Hawthorn, Victoria, 3122, AUSTRALIA. 03-818-5062

Belgium

553-Apple Three User of Belgium/Holland, c/o Hendrik Van der Straeten, Vestinglaan 49, 2580 Sint-Katelijne, WAVER, BELGIUM. 015-205-328

Denmark

485-FORMICRO, c/o Ulrik Jantzen, Teglgaardsvei 6, Charlottenlund, DK-2920, DENMARK. 45-163-1760

England

74-B O O G Ltd (BOOG), c/o Barrie J. Towey, 42 Warwick Close, Bury, LANCS. BL8 1RT, ENGLAND. 061-705-1031

France

FOG –110–Osborne Users FRANCE (OUF), c/o William A. Graham, 10 rue Saint Nicolas, 75012 Paris, FRANCE. 43-44-82-65

Greece

448-International Commodore Users Group (ICUG), c/o Michael J. Mahoney, P. O. Box 1048, APO, NY 09291.

Guam

433-APO/FPO IBM PC Users Group, c/o Charles Schell, 2043 A Plumeria Blvd, APO San Francisco, 96334.

Israel

FOG – 33–Israel Osborne Users Group (IOUG), c/o Eliahu Zuck, 8 Lakhish Str., Tel Aviv, 64164, ISRAEL. 0-523-4043

Italy

450-San Vito Commodore Users Group, c/o MSgt Willie J. Johnson, 7275th SPS Box 1871, APO, NY 09240-5366.

New Zealand

FOG – 53–New Zealand Osborne Group (NZOG), c/o 8 Titoki Avenue, Mangere Bridge, Auckland, NEW ZEALAND. 887-135
FOG –109–Central Region Osborne Group (CROG), P. O. Box 6571, Te Aro, Wellington, NEW ZEALAND. 640-479-1172

Panama

275-Panama Canal Atari Users Group, Apartado No. 5265, Balboa-Ancon, PANAMA. 69-0958

South Africa

FOG – 90–Johannesburg Osborne Group (JOG), Box 33360, Jeppestown, 2043, SOUTH AFRICA. 011-51-6304

Switzerland

16-Zurich Osborne Group, c/o Peter H Grelling, Hofackerstr. 43, Dietikon, CH-8953, SWITZERLAND. 093-352-802

Turkey

302-Computers Anonymous, c/o Ric Rubio, PSC Box 1499, APO NY, 09289-5364.

West Germany

FOG – 36--Computer Club Deutschland (CCD), c/o Werner Dworak, Allewind 51, 7900 Ulm, WEST GERMANY. 07-304-3274
FOG – 24–American German O G (AGOG), c/o Rody Anglin, HQ 15th Ordnance Battalion, APO, NY 09175. 061-52-4210
469-Augsburg Apple User's Group (AAUG), c/o Rob Frazier, USAFSA Box 1918, APO, NY 09458.
436-International Computer Club Europe, c/o J. Hendrix, B2SB, 1st AD, APO NY, 09066.
461-Stuttgart Local Commodore Users Grp (SLUG), c/o Don Rimestad, HHC VII Corps, Box 228, APO NY, NY 09107.
FOG – 62–First Ramstein O G (FROG), c/o Wilburn Fant, Box 10179, APO New York, NY 09012. 496-305-224
434-Amer. Comp. Users Temp. in Europe (ACUTE), Postfach 4, D-8818 Lehrberg, WEST GERMANY.
554-ProPC Users Group (ProPCUG), c/o Harry W. Hertz, P. O.Box 2664, D6750 Kaiserslautern, WEST GERMANY. 49-631-411-7188

International Machine-specific Groups

FOG – 96–ERC-Osborne Users Group (ERC-OUG), c/o A. W. Adkins Jr., 10418 44th Avenue, Beltsville, MD 20705. 301-937-7954
101-MUMPS Users Group, 4321 Hartwick Road Suite 510, College Park, MD 20740. 301-779-6555
FOG – 85–Microcomp. In Sup. Of Trans. (MIST), c/o Wycliffe Bible Translators, P.O. Box 188, Eastlake, CO 80614. 303-450-9608
337-TI PPC Notes, P. O. Box 1421, Largo, FL 34294-1421.
610-National Epson Users Group (NEUG), P. O. Box 1076, Lemont, PA 16851. 814-237-5511
611-Amateur Radio Research/Development (AMRAD), P. O. Drawer 6148, McLean, VA 22106-6148.
607-Sanyo National Users Group (SNUG), c/o Ken Fowles, 1111 W. El Camino Suite 109-402, Sunnyvale, CA 94087-1026.
173-Tandy 2000 Orphans, c/o David Royce, 387 Main Street, Westport, CT 06880.
601-PolyMorphic Systems Owners & Users, c/o Ralph Kenyon, 191 White Oaks Road, Williamstown, MA 01267. 413-458-8421

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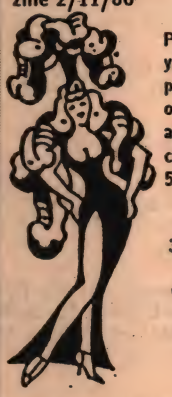

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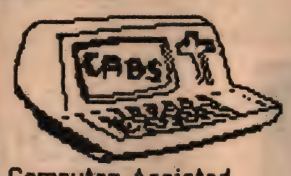

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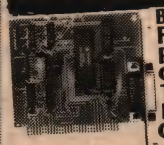

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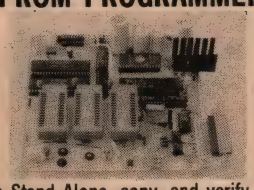

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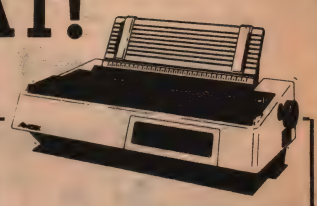

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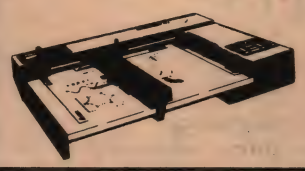

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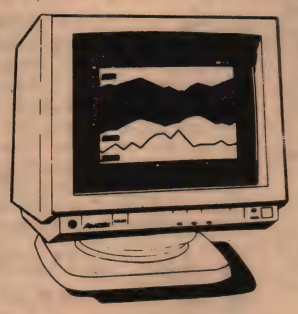

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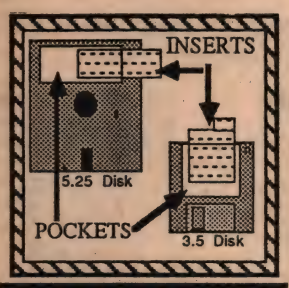

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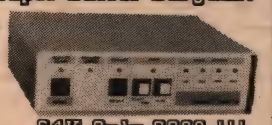

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NEC is really going to screw up the laptop computer market. Why couldn't they leave well enough alone and come out with another "Me too" machine. Oh no! One of their nefarious designers (A sadist no doubt) came up with their new "MultiSpeed" that will cause chaos in the industry.

Let's examine history ... I.B.M. came out with a laptop that really STINKS. Toshiba built their T-1100 which laid waste to the I.B.M. Zenith's 181 introduced the "super twist" (NEC invented it) display and, at last, one could read a laptop's screen. Now NEC has, with malice aforethought, introduced their "MultiSpeed." The $%×#@&* thing is a disgrace!!!

1. NEC must think that just ANYBODY should be able to operate a computer. We computer "nerds" have spent thousands of hours learning a zillion commands. With our knowledge we make millions each year teaching people to use their micro. I find no fault with such standard equipment as the two 720k drives, 640k RAM, or serial & parallel ports. The problem is that NEC put a DATABASE MANAGER, NOTE PAD, WORD PROCESSOR (with spelling checker), and a COMMUNICATIONS PROGRAM in 512K of ROM. One can "pop up" any of the three by hitting two keys ... even if they are in the middle of 1-2-3. While operating any of these "pop ups" one can hit a little key named HELP and the computer becomes a pedagogue.

This is an outrage! NEC is deliberately trying to put us "nerds" on the unemployment rolls, which is damaging to the economy as well as being un-American.

WHAT HAPPENED TO JAPANESE HUMILITY?

2. NEC is such a "show-off." Just because they invented the V-30 microprocessor (A super fast 8086) they didn't have to use it in the MultiSpeed ... and, run it at 9.54 MHz! The darn thing is much too fast. NEC must bear full responsibility for an epidemic of severe eye strain that will surely ensue ... for, you see, if you BLINK, you will MISS something. A directory scrolls by so fast it's just a blur. (NEC hardly mentions it but one can "Trick" the MultiSpeed into running at regular speed.

A Lotus spreadsheet raised over 10,000 RANDOM numbers to the 20th power (@rand×20*@rand×20). A Toshiba T-1100 recalculated in 2:29 ... The NEC in :52.7 and an AT or T-3100 in :47. This is UNFAIR competition.

CONGRESS MAY INVESTIGATE

3. Toshiba is selling their T-3100 at $4,495 (gasp!) faster than they can make them. NEC has artifically priced their MultiSpeed at $1,995.00 in direct violation of a recent agreement concerning "dumping" signed between the USA and Japan. NEC's scheme is not only unfair competition, it may be illegal!!

BEWARE OF THE HEALTH DANGER!

4. DO NOT show the MultiSpeed to any of the 50-60 thousand people who just bought another laptop. An involuntary gag reflex (They will barf their brains out) is a certainty.

GUARANTEE WITH A "CATCH"?

5. NEC's guarantee is so unbelievable I smell a RAT. If a MultiSpeed fails within 1 year you call an 800 number, and, if you have an acceptable credit card, they Federal Express another so you have it the next morning. They include a return FedEx label so your cost is ZILCH! Such a policy will put thousands of service technicians out of business. I haven't read the fine print but I bet there is some "hocus-pokus" therein.

Before we uncovered NEC's dastardly plot I ordered 1,000 of the critters. After one is appraised of this conspiracy, I can't imagine you actually buying one (You would become a co-conspirator). Oh sure, dealers will make a fortune off these things, but it is well documented that computers dealers have little, if any, conscience.

HOW CAN MY CAT KNOW?

The knowledge that I have become involved, albeit unwittingly, in the conspiracy has caused insomnia, interferred with my sex life, and even my cat won't come near me. Therfore, I'll do almost anything to set things right once again. I have reached the point where " I don't want the cheese ... just lemme outta the trap"!!

CAN YOU BE BRIBED?

I only hope that there are enough people who just don't give a damm about their fellow man and will take these off my hands. Here is the proposition. Buy one and choose a Honeywell RGB monitor (the NEC drives it) and a Diablo Comp. printer for FREE. Buy two and I'll give you a new Toshiba T-1100 (Nobody will buy them anyway when they see the NEC) or a NEC MultiSync EGA monitor FREE.

Don't get "ripped off" and pay $495.00 for the external 5¼" drive. Buy the NEC and, for $9.95, we supply all the hardwre and software you need to transfer files to and from a PC/XT/AT. If you don't need the "freebies," call me. I'll listen.

YOU CAN'T LOSE

If, within 30 days, you regret aiding and abetting NEC, I will refund your money ... no strings attached, Stewart Fason, President for life.

CLOSEOUT SPECIALS

All are new in factory cartons with warranty.

Leading Edge "AT" (same as Sperry "IT")	1,099.00
ADEUS 26 cps (Diablo compatible) printer	199.00
Honeywell serial cards com 1 or 2	19.95
1200 HD w/256k/10mb h-drive	799.00
Toshiba T-321 printer	439.00
Toshiba T-1100 laptop 512k	899.00

All merchandise subject to prior sale.

THE NETWORK ANSWER

D-LINK has the speed of 3-COM or Novell with far more flexability, and, one doesn't need a Ph.d in computer science to set it up. A local lawyer set up 4 stations in about one hour so you know it's simple. Handles up to 250 stations. The price is shameful ... retales for only $395.00 per card (we can't even spell retale). If qualified, we will let you try it for 30 days. Then, pay up or send it back.

LEADING EDGE TTL MONITOR

$59.00

LOTUS FILES SUIT

"TWIN is 99.9% compatible with 1-2-3." **PC Magazine** 2-10-87. Goliath sues David (Always bet on Goliath). Better grab your TWIN (no copy protection) now while you can for $39.95 or, later pay Goliath $495.00 for 1-2-3.

WHO IS PC SYSTEMS?

Many advertisers are little more than a telephone booth. We currently have the largest stock of name brand computers in the country (over 3,000) for immediate shipment. As of 12-12-86 we had over $2,000,000.00 in our checking account (heh,heh) with Savings of America, Tequesta, FL (Acct #900-8578). We are big, rich, and reliable.

ORDERS
305-863-8446

PC Systems

3705 Shares Place, West Palm Beach, FL 33404

You may wish to call our BBS at 305-747-8329 for info on other awesome bargains.

CLASSIFIED

CLASSIFIED INFORMATION

The classifieds are for **Pre-Owned items and Software ONLY.** New equipment, services etc. must use regular Display space. Please note: Pre-prepared classified ad artwork should not include typographic/graphic advertising of any manufacturer, brand name or otherwise registered logos. The advertiser is welcome to use his own company logo as a heading for his classified ad. Those wishing to include registered manufacturer and brand name graphics must use regular display advertising space.

Instructions

In order for us to keep the ad rate low and insure accuracy, it is necessary that the following procedures are followed.
1. Type or print your ad legibly on a plain sheet of paper. Ads received that are difficult to read will be returned.
2. Write the desired category at the top of each ad. Please refer to the index, this page, if a category is not indicated, ad will be placed in the Miscellaneous section.
3. If more than one ad is submitted, use a separate piece of paper for each ad, making sure your complete name and address is at the bottom of each ad.

CLOSING DATE — 2nd Monday of the month. Example: Ads received by the 2nd Monday of March will appear in the May issue. **Due to our low rates, you cannot change, cancel or receive a refund on classifieds after they are typeset.** In most cases, ads are typeset within a week after they are received.

RATES

Subscribers: 25 cents per word. $5.00 per ad minimum charge. The first two words (if underlined) will be set in bold face at no additional charge. Bold face or all cap words thereafter will be fifty (50) cents per word. Special bold headings, partial lines, open space or leader dots are:
1 line of leader dots with price, $1.25 per line
6.5 point line, $1.25
10 point bold line, $2.00
Maximum of 15 characters per line

Non-subscriber rates are double all rates listed above.

REPEAT ADS

Ads running more than one time. A repeat ad will be coded at the end of the ad with month the ad started and issue ad ends. Example: 8-160. Ad started Aug. ends 160 issue or January. NOTE: Please check to make sure your ad has been correctly coded.

PROOFS

Due to low classified rates a free checking copy or tear sheet cannot be sent if proof of insertion is desired, please send $3.00 extra.

PHOTOS

A photo will draw attention to your ad. Photos are $7.00 per column inch. Only black/white glossy photos will be accepted. Photos which contain typographic/graphic burn outs are not acceptable. Maximum photo size is 2", minimum size is ½".

STARS

Have a special piece of equipment to sell? Reducing the price of an item and want to attract attention to that fact? Take advantage of our low price "star" attention getters.

It's a fact...unusual "artwork" in or above an ad draws attention to that ad and the reader retains interest in that product longer.

Get Response Quicker with "Stars" above your ad. Above is the rate for different sizes. Just mark "stars" and the price of the one you choose above your ad copy and we'll take care of the rest. Be sure to include the cost with your ad payment.

CS-ABREVIATIONS

add-post ..... add postage
add-post-AP ... add postage, all prices
FC ..... Freight Collect
MBG ..... money back guarantee
PP ..... postage paid
SASE ..... send self-addressed stamped evelope for check return or information requested
10 DRP ..... 10 day return privilege
CCR ..... check clearance required

EXAMPLES OF STYLES:

Normal

PDP 11/03 COMPUTER
Complete **OPERATING SYSTEM** with RT-11 system software plus basic. Brand new October '78. Sell complete at $7,000, or separate at:
11/03 Computer $900
Dual RZ-1 disc $1,000
32KB memory $2,800

PDP 11/03 COMPUTER. Complete operating system with RT-11 system software plus basic. Brand new October '78. Sell complete at $7,000 or separate at: 11/03 Computer $900, Dual RX-1 disk $1,000. 32KB memory $2,800. VT-52 video $1,500, GE Terminet 30 printer $800. Intertube video terminal $400. **John Doe,** POB 1234, Somewhere, USA 00000. 123-456-7890.

10 Point Centered Head

PDP 11/03 COMPUTER

Complete **OPERATING SYSTEM** with RT-11 system software plus basic. **Joe Doe,** POB 1234, Somewhere, USA 00000, 123-456-7890.

Leader Dots

Intertube video terminal $400
Joe Doe, POB 1234, Somewhere, USA 00000. 123-456-7890.

CLASSIFIED ORDER FORM

Classified Dept., COMPUTER SHOPPER
P.O. Box F, Titusville, FL 32781

To figure cost of ad, the rate is 25 cents per word for subscribers and 50 cents per word for non-subscribers (50 cents per word bold face) $5.00 per ad minimum charge.

Run under heading # _____
See Index This Page
(Please type or print)

INCLUDE 25-CENTS PER WORD FOR YOUR NAME AND ADDRESS

Name _____

Address _____

City _____

State _____ Zip _____

INCLUDE 25 CENTS PER WORD FOR YOUR NAME AND ADDRESS FOR SUBSCRIBERS AND 50 CENTS PER WORD FOR NON-SUBSCRIBERS.

(For additional words, use separate sheet of paper)

Remittance for $_____ is enclosed.
You may run my ad _____ issues.

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(101) TANDY COMPUTERS FOR SALE

★ ★ ★
CLONE DEALERS
See Classification #115. 03-88

★ ★ ★
COMPUTER STUFF!
We buy, sell and horsetrade Apples, Macs, Model 100, Commodore, IBM & Clones. Call Now! **318-865-6743** 4—9 pm CST. **Shreve Systems,** 845 Lark Ave., Shreveport, LA 71105. 01-89

★ ★ ★
Extra Income! Over 100 proven opportunities. Complete list. Tandy computer helpful. Send $3, **Extrainc,** Box 31212, Lafayette, LA 70503. MBG. 04-91

Model 1 monitor & keyboard $125; Expansion interface w/32K $150; RS232 $95; DD-board $75; 2 disk $45 each; All for $250. LDOS included. Send SAE for software list. **Harvey Churkey,** 2806 Katherine Court, Plover, WI 54467.

.. For an offer you can't refuse ...
GODFATHER'S used computer SYNDICATE

$$$ We have a limited selection of models 1's, II's, III's, IV's, 12's, 16's, 1000, S 2000, S & 3000, S. We give a full 90 day warranty. Daisy Wheel II w/tractor $800, Other printers avail. Buy—Sell—Trade. **GODFATHER'S USED COMPUTER SYNDICATE,** PO Box 3037, 851 W, Hwy. 436, Forest City, FL 32714. **305-774-1111.**

MOD4P with 128K RAM, 2 floppies, internal modem, much software, incl. Scripsit. **Tony H. McLendon,** POB 2218, Laurel, MS 39442. 03-87

Model 100 Laptop 32K RAM & cassette & briefcase & all cables. Like new $350. **904-255-5328.**

Model 12 with 12 MEG hard drive, Scripsit, Profile $1,200. **904-255-5328.**

Model 4P $750/offer. Includes modem, carry case, printer cable, ALL software. **John 415-795-9156** evenings. 04-88

Radio Shack Model-II with one built-in 8" floppy drive in excellent condition. $600 shipped. **Rob Lee,** 25 Amaryllis Ave., Waterbury, CT 06710. 03-88

SELL OR BUY FAST!
Full Service Brokerage! Easy, no risk. Only 1% (min. $20) to list, 10% when sold. Complete list $10, VISA/MC.
1-800-843-6713
In Florida: (305) 459-1555

Phoenix MultiList Systems, 2755-C N. Banana River Dr., Merritt Island, FL 32952.

★ ★ ★
THIS IS IT
Still wasting time? See our ad classification 115B.

TRS-80 Model 12, single disk drive, 300 baud modem, will all cables, manuals, etc. Asking $600 + shipping. Also TI99/4A $75 + shipping. **John Yeatts,** 205 Cottontown Rd., Lynchburg, VA 24503. **804-385-9462** after 7:00 pm

TRS-80 Model 1, 48K, 2 drives, expansion interface, programs. Model III w/2 drives, both perfect cond. $250 each complete: Epson MX-70 printer $150. Days **Eugene 714-734-8181.**

TRS80 Model 4P 128k, like new, 2 Like New disk drives, built in modem. Much software $850/offer. **Dennis 206-533-7408** after 6pm, 402 First Ave., Aberdeen, WA 98520. 03-87

TRS 80 Model III, 2 disk drives, 1 Centronics-printer SAT-software $600. **213-320-8994,** 19142 Van Ness Ave, Torrance, CA 90501.

(102) TANDY COMPUTERS WANTED

★ ★ ★
CLONE DEALERS
See Classification #115. 03-88

I'M LOOKING for Model 12. **619-560-5984.** 04-88

.. For an offer you can't refuse ...
GODFATHER'S used computer SYNDICATE

$$$ I Buy, Sell, & Trade TRS-80's for cash. **GODFATHER'S USED COMPUTER SYNDICATE,** PO Box 3037, 851 W. Hwy. 436, Forest City, FL 32714. **305-774-1111.**

Wanted: Old computers. See section 188. **David Larsen** for details. 7-89

SELL OR BUY FAST!

Full Service Brokerage! Easy, no risk. Only 1% (min. $20) to list, 10% when sold. Complete list $10, VISA/MC.

1-800-843-6713
In Florida: (305) 459-1555

Phoenix MultiList Systems, 2755-C N. Banana River Dr., Merritt Island, FL 32952.

Tandy 16B or 6000 also external H.D. for above. **309-674-3314** days, or **309-688-1089** pm. Ask for **Jim Sr.**

★ ★ ★ 03-87

Wanted: Expansion interface disk drives, hardware, software for Model I TRS80, level 2. **Phil Cranston,** 1016 Avondale, Jackson, MI 39216.

We buy used Model 4P-w/2 drives, in working condition. **914-271-3969. 01-87**

(103) TANDY SOFTWARE, PERIPHERAL

ATTENTION: $$WIN$$ with **THOROUGHBRED/HARNESS, GREYHOUND** Handicapping Software...$29.95, enhanced...$49.95. Professional **FOOTBALL** handicapper...$39.95. MC/VISA. Free information. **Software Exchange,** Box 5382CS, W. Bloomfield, MI 48033. **1-800-527-9467.**

Attention–the magazine for Tandy 1000 owners. 1001 News. Articles, reviews, how-tos, tips solely for 1000 users. $18 for 12 issues. **Pro-Writer Services,** 2504 E. Birch, Gulfport, MS 39503. 03-87

★ ★ ★

CLONE DEALERS

See Classification #115. 03-88

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COCO ARTIFICIAL INTELLIGENCE
(Disk Only)

THE THERAPIST—far better than the original Eliza. Talks w/Speechpak$24.95
THE A.I GAME—a thrill a minute$24.95
THE JOKESTER—when you need a laugh, now with our famous Talking Head $26.95
THINKING ART 2—graphics with music $24.95
BEST EXPERT SYSTEM TOOLKIT—build your own Expert System, includes 3 complete Expert Systems ready to consult, tutorial and Manual $59.95
COCO A.I. DEMO DISK & catalog . . .$3
or send large SASE for catalog with many more pgms! **THINKING SOFTWARE, INC.,** Dept. Coco, 46-16 65TH Place, Woodside, NY 11377 03-88

COCO Users!!! NEW professional software: BTU Analysis: Analyze heat loss/gain for proper heating and cooling. IRA Analysis: Compare IRA's and get more for retirement dollars. Professional results. SPECIAL INTRODUCTORY OFFER. Send S.A.S.E. for FREE details. **A TO Z UNLIMITED,** 901 Ferndale Blvd, High Point, NC 27260. 03-87

Coco Ads - a monthly magazine for the color computer user. Many programs, articles, reviews, tips for the Coco, and a classified ad section. Send for free sample: **PD Software,** PO Box 13256-C, Houston, TX 77219. 03-89

Coco Users - Over 25 different program packs for your Coco. Many good programs for your library. Games, Utilities, business, Educational, music, art. Send for current catalog. **PD Software,** PO Box 13256-C, Houston, TX 77219 03-89

Microtek MT-32 32K memory expansion/parallel printer interface for Model 1 $30. **Len 212-777-4353.**

Complete set of "80-MICRO" Magazines, Jan. '80 to Dec. '86. Asking $100. Call **503-343-1293.**

DATA-LOG-64

Menu driven data base (MSDos)
$19.95 pp
Demo: $3 pp
The Cecap Company
27232 Kane Lane
Oak Ridge North, TX 77385 03-91

"Microcomputer Users" Earn...$5.00—$35 hourly. Free Report! **Computime,** 8812-C Duncanson, Bakersfield, CA 93311.03-88

★ ★ ★

Color Computer programs for only 50¢ each! Many Machine language! Send $5 for 10 programs on tape or disk or write for free catalog. **Coco Software,** PO Box 256-C, Holland, MI 49423. **616-396-7577.**

★ ★ ★

DISK DRIVES w/warranty, qtys available. 5¼": Seagate ST412 10.7MB $150; Q540 35.7MB $575; 10Meg Kit w/controller & cables, $250. 8"; Q2020 21.33MB $225; Q2040 42.66MB $525; Q2080 85.32MB $895. Model 16 Hard Disk Drives in Stock! **ERD Systems, Ed or Dan, 617-851-5852, 617-452-6000.**

Earn $1100 Per Month With Your TRS-80, Apple, Commodore or IBM Compatible. This program will allow you to enjoy a handsome full or part-time working in your own home and setting your own hours. This unique program has been tested and used for over **seven** years and its service has had phenomenal acceptance. We provide all the know-how, the consultation service, and all the materials needed to make this unusual business opportunity a success from the first day. If you like the idea of operating a highly profitable business out of your own home, if you like working with a computer, and if you like making money, then this could be the opportunity you have been searching for. All you need is your TRS-80, Model I, III, IV or 1000, Apple or Commodore computer with or without disk drives, a minimum of 16K memory, a reliable printer, and the desire to turn your micro into a highly profitable home business enterprise. For complete details, send $10 (VISA, MASTERCARD and **AMERICAN EXPRESS** honored) to: **Viking, Inc.,** 910 Soo Blvd., Rice Lake, WI 54868. Ask for "OPPORTUNITY 87".

FREE PROGRAMS!! TRS80-coco/TRS80-mc10/TRS80-III/TRS80-4/TRS80-100/TRS-80-200/TRS80-1000/TRS80-2000/TRS80p-c3/Apples/IBMpc's. Send stamps! **EZRAEZRA,** Box 5222-PRMR, San Diego, CA 92105.

Filepro-16 Users. Send for descriptions of ready to run applications or free estimate on custom designed applications. **Roy Schoeller,** 500 Northpointe Pkwy #313, Jackson, MS 39211. Phone **601-956-9798.**

IF YOU want to make money with your computer then you need our new book—How to Get Rich with your Microcomputer. Rush $14.00 postpaid to: **James Jones,** PO Box 32, Woodlawn, VA 24381.

Tandy 1000 second disk drive, used only 1 day, for $60. **Michael Krasowski,** 703 Wilson St., Chester, PA 19013.

Model 100/102/200 affordable portable software. Send for free information. **CSA Software,** PO Box 22261, Chatanooga, TN 37422. 03-91

★ ★ ★

II/12 SOFTWARE

Over 100 original Tandy Programs. Many unused in cellophane. Virtually all software from Cat# 26-4502 thru 26-6302. 80% off list price or even lower! SASE. **Wilkinson,** 21 Perryville, Irvine, CA 92720. **714-551-4911.** 04-88

SEESOF SEESOF

My Artist. Create stunning pictures with this high resolution graphics program for the **COCO3.** Select from 64 colors while drawing and painting on the full screen (no distracting menus). Fast, machine language, picture saving and loading. Complete manual included. Requires 128K **color Computer 3,** joystick, cassette or disk (specify which). Check or MO for $14.95 MBG. $3 nonrefundable shipping and handling included. South Carolina residents add $.75 sales tax. **SEESOF,** Box 574, Beaufort, SC 29901. Phone **803-524-0116.**

"PROGRAMS PROGRAMS PROGRAMS" "PUBLIC DOMAIN PROGRAMS" Over 1100 programs on 75 disks for model 3, over 1600 programs on 115 disks for model 4 and growing daily Free listings. **JaRICK SOFT,** PO Box 183, Fairmont, MN 56031-0183. 03-89

RENT DOMAIN/COMMERCIAL $2/3 disk! Tandy 1000 software - Rent $2—Buy $3 (including DS/DD disk). Ship US/APO/FPO/Canada. **804-853-3441. Colony,** 728 Muskogee, Norfolk, VA 23509.

Survey—Boundary TRS-80/100 24k basic $29.95. Description $1. **P. Billings,** 12134 Bonnie Terr., Dept. CSD, Seminole, FL 33542. 02-90

TRS-80 Software, Models 1/3/3/4P/4D, many useful programs, Economical prices, Send $2 for listing: **Practical Programs,** 1104 Aspen Drive, Toms River, NJ 08753. 04-92

Tandy 1000 Owners

20 Meg hard disk with WD controller and cables, $439; memory boards, tape drives, etc. Call **301-768-1890** or write **Micro Systems,** PO Box 1750, Glen Burnie, MD 21601.

VIDIO-2100

VCR movie Index System (MsDos)
$19.95 pp
Demo: $3 pp
The Cecap Company
27232 Kane Lane
Oak Ridge North, TX 77385 03-91

WANTED! Boot disk and manuals for LNW-80 computer must be cheap. Call anytime **818-300-9220,** 607 W. Live Oak, San Gabriel, CA 91776.

WHEEL FORTUNE: Computer version of the popular TV game show. 4/1000 $9.95 + $2 SH. **NEWMAN COMPUTER,** 2 Briarmills, Bricktown, NJ 08724. 02-88

WORD PROCESSOR. Tandy 1000 (compiled) or BASIC for Model I, III, 4 (III mode) 16K—48K, tape, disk. Full featured, with automatic wraparound, centering, justifying, underlining, editing, formatting, global search/replace, form letter generation, set fonts, insert graphics. With 20-page manual. Specify your system. $10 tape, $12 disk, $25 Tandy 1000. **D. Hinrichs,** 2116 SE 377th, Washougal, WA 98671.

(104) TEXAS INSTRUMENTS COMPUTERS FOR SALE

Enormous TI-99/4A Inventory. Call **414-731-3478** or write: **BRAATZS COMPUTER SERVICES,** 719 E. Byrd St., Appleton, WI 54911. Send $1 to cover catalog postage. Refunded with your first order. 12-87

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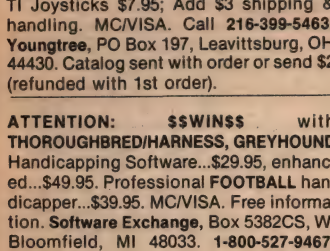

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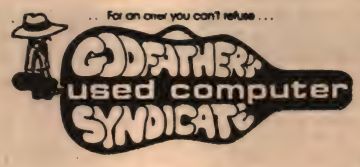

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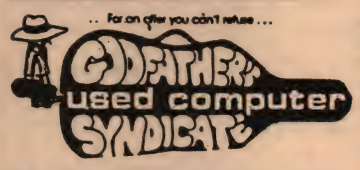

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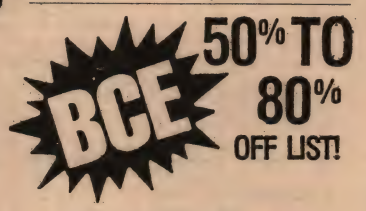

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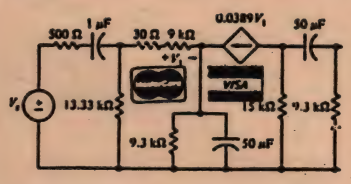

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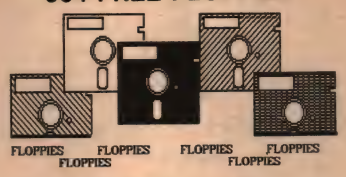

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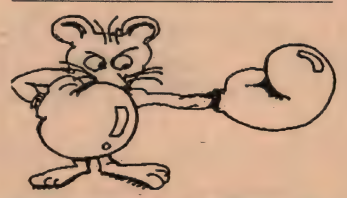

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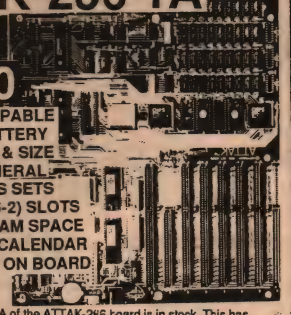

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All BARE PCB come with parts list and where they plug in

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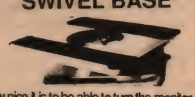

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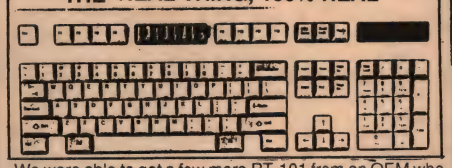

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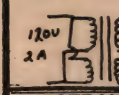

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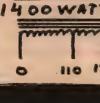

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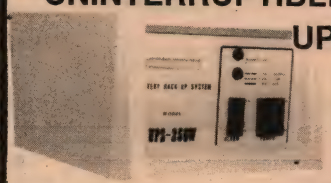

UPS-250W, UPS-400W

1. High efficiency	85%
2. Sinewave(avoid modified square wave)	Sinewave
3. Internal no-spill battery	Yes
4. External battery terminals	Yes
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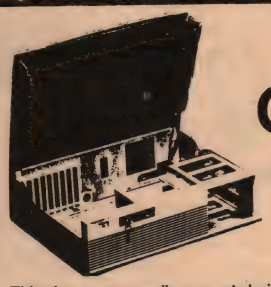

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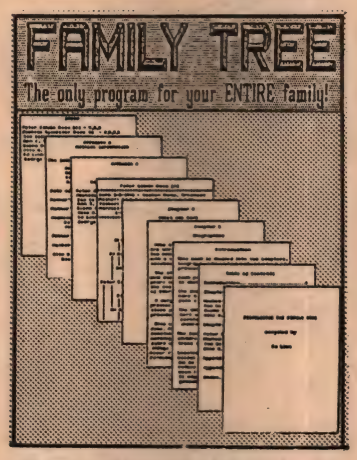

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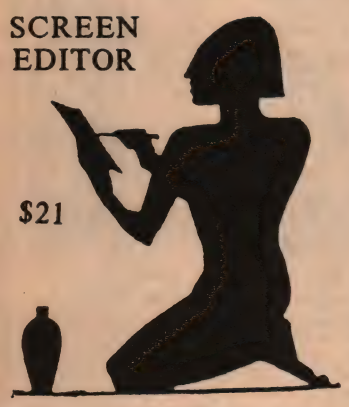

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☐ **PINBALL RALLY** (#557) You asked for it! Here are three pinball games that vary in complexity, PINBALL, RAIN, TWILZON2.
☐ **DND** (#567) Dungeons and Dragons, this uses text characters instead of graphics.
☐ **REFLEX POINT** (#487) Self styled action game similar to ROBOTECH cartoon series.

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☐ **PC-KEY DRAW** (#344-345) A small CAD system. Lots of demonstration files.
☐ **PC-PICTURE GRAPHICS** (#136) Drawing package allows you to zoom, color, and store pictures.
☐ **PC-GRAPH** (#418) Allows user to create graphics from PC—File report files.
☐ **PRESENT** (#471) Professional slide shows are a snap with the advanced graphic features of this program. Includes a screen "capture".

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☐ **XLISP** (#148) Lisp language interpreter.
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☐ **PC-MUSICIAN** (#127) Compose music on your PC, save and play again.
☐ **PIANO MAN** (#279) Play your keyboard like a piano.

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☐ **SIDEWAYS** (#265, 411) Prints text sideways on an Epson printer.
☐ **SETPRTR** (#79) Sets up Epson print from a menu.
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☐ **POLYGLOT & LETTERFALL** (#542) Two educational programs to match sentences, words, and definitions, Q&A's. Typing tutor is great!
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☐ **ULTRA-UTILITIES** (#133, 245) Recover lost files, modify sectors, etc. Like Nortons.
☐ **SYSMENU** (#250) Build a menu driven menu system. Excellent for hard disks.
☐ **PC-DESKMATES** (#405) Better than Sidekick and all of the rest of the memory resident desktop utilities.
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☐ **UNPROTECT** (#414) Various routines to disconnect protection schemes.
☐ **PATCHES** (#376) Make back up copies of some of the most popular commercial programs with this collection.
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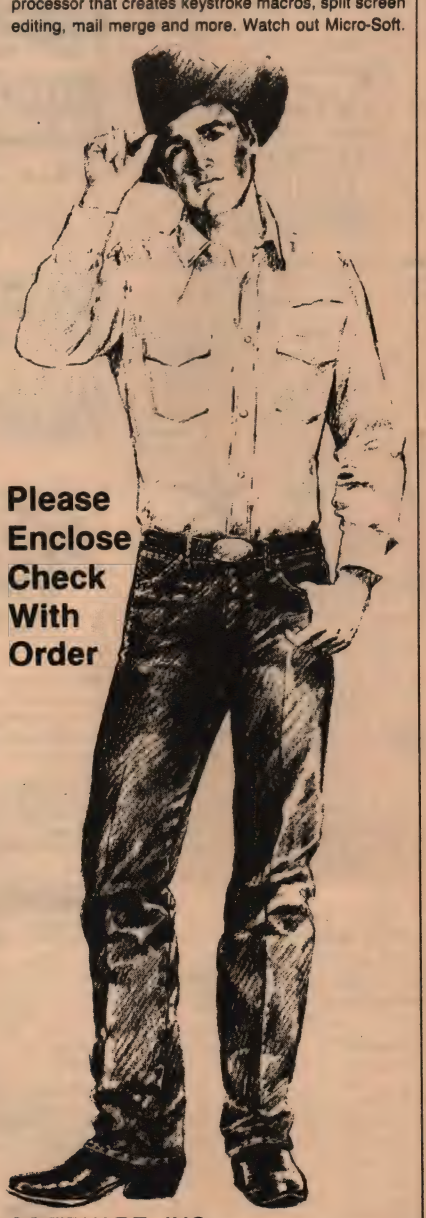

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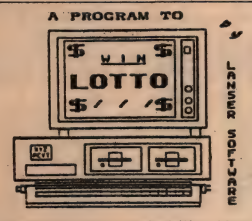

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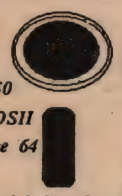

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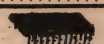

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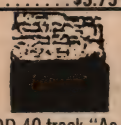

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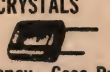

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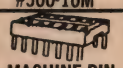

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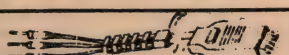

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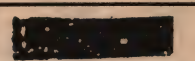

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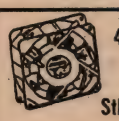

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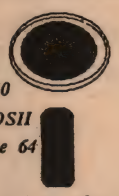

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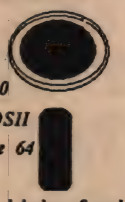

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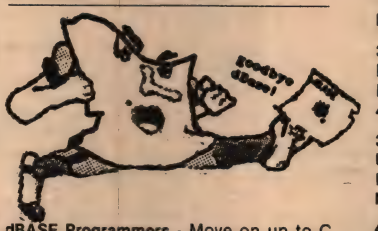

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7410	.35	.25	74125	.55	.45
7414	.49	.39	74126	.75	.65
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7417	.45	.35	74150	1.35	1.25
7420	.35	.25	74154	1.35	1.25
7430	.35	.25	74158	1.59	1.49
7432	.39	.29	74173	.85	.75
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74LS07	1.09	.99	74LS189	4.59	4.49
74LS08	.29	.19	74LS191	.59	.49
74LS10	.29	.19	74LS193	.79	.69
74LS14	.49	.39	74LS221	.69	.59
74LS27	.35	.25	74LS240	.79	.69
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74LS90	.49	.39	74LS368	.49	.39
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CD4011	.19	CD4082	.25
CD4013	.29	CD4093	.35
CD4016	.29	CD4094	.89
CD4017	.55	CD40103	2.49
CD4018	.59	CD40107	.69
CD4020	.59	CD40109	1.49
CD4024	.49	CD4510	.69
CD4027	.35	CD4511	.69
CD4030	.29	CD4520	.75
CD4040	.65	CD4522	.79
CD4049	.29	CD4538	.79
CD4050	.29	CD4541	.69
CD4051	.59	CD4543	.79
CD4052	.59	CD4553	4.95
CD4053	.59	CD4555	.79
CD4059	3.95	CD4566	2.49
CD4063	1.95	CD4572 (MC14572)	.39
CD4066	.29	CD4583	.89
CD4069	.25	CD4584	.39
CD4070	.25	CD4585	.89
CD4071	.25	MC14411P	8.95
CD4072	.25	MC14490P	4.49

COMMODORE CHIPS

Part No.	Price	Part No.	Price	Part No.	Price
WD1770 Disk Cont.	19.95	6551 ACIA	3.29	8722 MMU	9.95
SI-3052P 5V Positive Voltage Reg. 2A	5.95	6560 VIC-I	10.95	*251104-04 Kernal ROM	10.95
6502 MPU w/Int. Clock	2.25	6567 VIC-II	14.95	318018-03 Basic ROM-C128	15.95
6504A CPU	1.95	6569 VIC PAL	14.95	318019-03 Basic ROM-C128	15.95
6507 CPU	4.95	6572 VIC PAL-N	14.95	318020-04 Kernal ROM-C128	15.95
6510 CPU	9.95	6581 SID	14.95	325302-01 64K ROM for 1540/1541 Drive	15.95
6520 PIA	1.75	8360 Text Editing	10.95	*325572-01 Logic Array	24.95
6522 VIA	2.95	8501 MPU	10.95	*82S100PLA (906114-01)**	13.95
6525 TPI	7.95	8502 MPU	7.95	901225-01 Char. ROM	11.95
6526 CIA	14.95	8563 CRT Contr.	15.95	901226-01 BASIC ROM	11.95
6529 SPI	4.95	8564 VIC	15.95	901227-03 Kernal ROM	11.95
6532 128x8 RAM, I/O, Tim Ar	6.49	8566 VIC PAL	29.95	901229-05 Upgrade ROM (For 1541 Disk Drive)	15.95
6545-1 CRTC	2.49	8701 Clock Chip	9.95		
		*8721 PLA	14.95		

*No specs. available
**Note: 82S100PLA = U17 (C-64)

MICROPROCESSOR COMPONENTS

MISCELLANEOUS CHIPS

Part No.	Price
D765AC	4.49
WD1770	19.95
2661-3	5.95
WD9216	9.95

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Z80-CTC	1.79
Z80-DART	4.95
Z80-PIO	1.79
Z80A	1.35
Z80A-CTC	1.49
Z80A-DART	4.95
Z80A-PIO	1.49
Z80A-SIO/0	4.95
Z80B	2.95
Z80B-CTC	3.49
Z80B-PIO	4.29

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6551	3.29
6800	1.75
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MC68000L10	19.95

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8073	29.95
8080A	2.49
8085A	2.29
8086	6.95
8086-2	8.95
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8087-2 (8MHz)	159.95
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8251A	1.75
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8254	2.95
8255A-5	1.69
8257-5	2.49
8259-5	1.95
8272	4.49
8279-5	2.95
8741	10.95
8748	7.95
8749	9.95
8751	39.95
8755	14.95

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ADC0808CCN	5.95
ADC0809CCN	3.95
ADC0816CCN	14.95
ADC0817CCN	8.95
DAC0808LCN	1.95
DAC1008LCN	6.49
AY-3-1015D	4.95
AY-5-1013A	3.95

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4128-20 (Piggyback)	131,072 x 1	(200ns)	4.49
4164-120	65,536 x 1	(120ns)	1.75
4164-150	65,536 x 1	(150ns)	1.15
4164-200	65,536 x 1	(200ns)	.95
TMS4416-12	16,384 x 4	(120ns)	4.25
8118	16,384 x 1	(120ns)	.69
41256-120	262,144 x 1	(120ns)	3.95
41256-150	262,144 x 1	(150ns)	2.75
50464-15	65,536 x 4	(150ns) (4464) (41464)	4.95
511000P-10	1,048,576 x 1	(100ns) 1 Meg	39.95
514256P-10	262,144 x 4	(100ns) 1 Meg	44.95

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2016-12	2048 x 8	(120ns)	1.69
2102-2L	1024 x 1	(250ns) Low Power (91L02)	1.95
2114N	1024 x 4	(450ns)	.99
2114N-2	1024 x 4	(200ns)	1.05
2114N-2L	1024 x 4	(200ns) Low Power	1.49
21C14	1024 x 4	(200ns) (CMOS)	.49
2149	1024 x 4	(45ns)	4.95
5101	256 x 4	(450ns) CMOS	1.95
6116LP-2	2048 x 8	(120ns) Low Power CMOS	2.95
6116P-3	2048 x 8	(150ns) CMOS	1.89
6116LP-3	2048 x 8	(150ns) Low Power	1.95
6264LP-12	8192 x 8	(120ns) Low Power CMOS	4.25
6264P-15	8192 x 8	(150ns) CMOS	3.59
6264LP-15	8192 x 8	(150ns) Low Power CMOS	3.75
6514	1024 x 4	(350ns) CMOS (UPD444C)	4.49
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TMS2532	4096 x 8	(450ns) 25V	5.95
TMS2564	8192 x 8	(450ns) 25V	8.95
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2716	2048 x 8	(450ns)	3.75
2716-1	2048 x 8	(350ns) 25V	4.95
27C16	2048 x 8	(450ns) 25V (CMOS)	6.49
2732	4096 x 8	(450ns)	3.95
2732A-20	4096 x 8	(200ns) 21V	4.25
2732A-25	4096 x 8	(250ns) 21V	3.95
2732A-45	4096 x 8	(450ns) 21V	3.75
27C32	4096 x 8	(450ns) 25V (CMOS)	6.49
2764-20	8192 x 8	(200ns) 21V	4.25
2764-25	8192 x 8	(250ns) 21V	3.75
2764A-25	8192 x 8	(250ns) 12.5V	4.25
2764-45	8192 x 8	(450ns) 21V	3.49
27C64	8192 x 8	(450ns) 21V (CMOS)	5.49
27C64-15	8192 x 8	(150ns) 21V (CMOS)	6.49
27128-20	16,384 x 8	(200ns) 128K 21V	4.95
27128-25	16,384 x 8	(250ns) 128K 21V	4.25
27128A-25	16,384 x 8	(250ns) 12.5V	4.95
27C128-25	16,384 x 8	(250ns) 21V (CMOS)	5.95
27256-20	32,768 x 8	(200ns) 256K (12.5V)	6.95
27256-25	32,768 x 8	(250ns) 256K (12.5V)	5.95
27C256-25	32,768 x 8	(250ns) 256K (CMOS) (12.5V)	8.95
27512-25	65,536 x 8	(250ns) 512K (12.5V)	19.95
68764	8192 x 8	(450ns) 25V	15.95
68766	8192 x 8	(350ns) 25V	16.95
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74HC10	.29	74HC245	.89
74HC14	.49	74HC253	.59
74HC30	.29	74HC259	.65
74HC32	.29	74HC273	.79
74HC74	.39	74HC373	.79
74HC75	.39	74HC374	.79
74HC76	.45	74HC393	.75
74HC85	.79	74HC595	1.19
74HC86	.39	74HC688	.79
74HC123	.89	74HC4040	.89
74HC125	.49	74HC4049	.59
74HC132	.49	74HC4050	.59
74HC138	.49	74HC4060	1.09
74HC139	.49	74HC4511	1.29
74HC154	1.19	74HC4514	1.19
74HC163	.65	74HC4538	.89
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74HCT00	.29	74HCT139	.59
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74HCT08	.29	74HCT175	.69
74HCT10	.29	74HCT240	.99
74HCT32	.29	74HCT244	.99
74HCT74	.49	74HCT245	1.19
74HCT86	.49	74HCT373	1.19
74HCT138	.59	74HCT374	1.19

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74C04	.29	74C221	1.49
74C08	.35	74C240	1.29
74C10	.35	74C244	1.29
74C14	.49	74C373	1.49
74C32	.35	74C374	1.49
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74C86	.35	74C920	9.95
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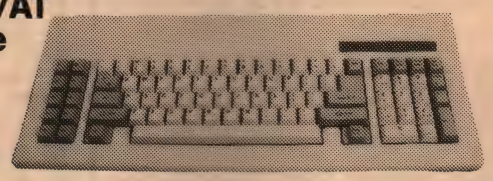

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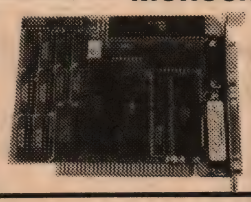

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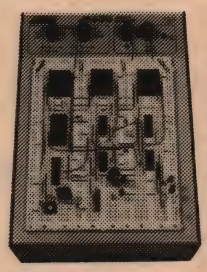

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(174) PRINTERS

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(186) MODEMS

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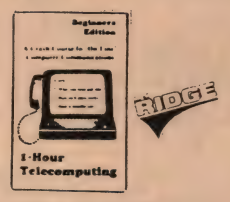

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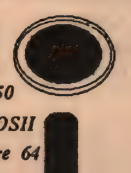

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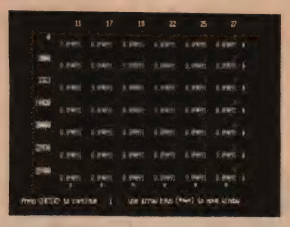

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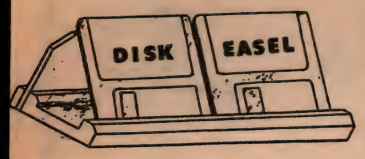

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27512 64Kx8	$14.75
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27256 32Kx8	3.55
27128 16Kx8	2.65
27C64 8Kx8	3.20
2764 8Kx8	2.55
43256L-12 32Kx8	14.60
6264LP-15 8Kx8	2.00

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Mother Boards (Expandable to 640K) XT Compatible Turbo	$139.
DSDD 48 TPI-360K TEAC Direct Drives	99.

TECHNICAL SUPPORT 813-961-5584

Vendor Line Inside Florida 813-961-9444

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NEW SEIKOSHA SP-1200 PRINTER

SAVE WITH CONFIDENCE – CALL MIDWEST MICRO

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PRICE GUARANTEE
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ONE CALL SHOPPING TOLL FREE
DEALERS CALL
800-528-4504

MidWest Micro-Peripherals
135 South Springfield Street, Saint Paris, Ohio 43072
Phone (513) 663-5488

Dear Friends,

Thank you for making our Seikosha SP 1000 printers so popular. We can now offer you the exciting SP 1200AI. With its added speed and versatility, this printer is destined to be a great favorite as well. At 120 cps plus both Epson and IBM compatibility the new SP 1200 is a wise choice for both home and business uses.

Even though this is a new model with the latest in printer technology, we are offering it to you at unbelievably attractive pricing. Therefore you can experience the thrill of having this stylish state-of-the-art printer and enjoy savings usually reserved for outdated models.

I invite you to compare the Seikosha SP 1200 AI from MidWest Micro with any printer deal you can find. Then grab your phone, dial our toll-free number and let us have one delivered to your door. You'll be glad you did!

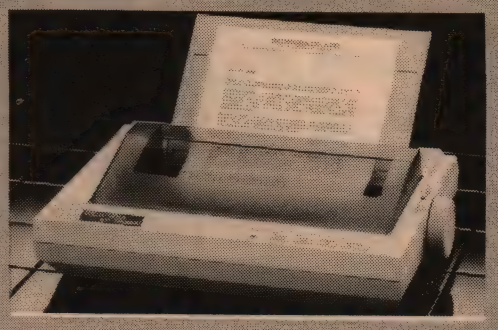
Thank you for your continued support.

Sincerely,
Mark L. Runkle
Mark L. Runkle
President
MidWest Micro

NOW YOU CAN GET SUPERIOR TECHNOLOGY AND CRAFTSMANSHIP WITH

SEIKOSHA SP-1200

YOUR PRICE
$229 (even less!)



List $349

Features of SP-1200AI

- 9-pin, impact dot matrix printing method
- Printing speed – 120 cps (Draft) and 25 cps (NLQ)
- Multi software modes, IBM® and EPSON® modes
- Quiet operation (below 52 dBA)
- Printing styles – Double-Width, Bold, Double-Strike, Italic, Superscript/Subscript and Underlining
- 8 kinds of dot addressable graphic printing (up to 1920 dots/line)
- Automatic paper loading and ejection system
- 128 download characters
- Multi-functional push-button front switches – 6 kinds of character pitch selection, NLQ mode setting and paper feeding
- Both cut sheet and continuous fanfold paper handling capability
- Optional Automatic Cut Sheet Feeder
- Now available - SP-1200AS serial printer

SPECIFICATIONS OF SP-1200AI

Printing
Printing Method: Impact Dot Matrix Method, Bi-directional (character printing), Uni-directional (graphic printing)
Printhead: 9 pins
Print Speed: 120 cps (Draft Pica), 25 cps (NLQ Pica)
Throughput: 63 lpm (Draft Pica)
Line Feed Pitch: 1/6, 1/8, 7/72, n/72, n/144, n/216 inch
Line Feed Speed: 6.7 lines/sec. (6 lines/inch)
Character Sets: 185 characters and symbols, 49 international characters and 128 download characters
Character Attributes: Double-width, Bold, Double-Strike, Italic, Superscript/Subscript and Underlining
Acoustics: Below 52 dBA (ISO/DIS 7779)

Media Handling
Paper Weight: 15 to 22 lbs., (52 to 81 g/m^2)
Paper Width: 4 to 10 inches (fanfold and cut sheet)
Original + 2 sheets (total thickness 0.2 mm)
Paper Path: Rear
Paper Feed Method: Tractor and friction

Interfacing
Parallel: Centronics compatible
Buffer: 2.3 K-byte

Ink Ribbon
Type: Special cassette type ribbon
Color: Black

Reliability
Printhead Life (MCBF): 80 million characters
Ribbon Life: 2.5 million characters

Options
8K-byte Buffer, Automatic Cut Sheet Feeder, Multi Strike Carbon Film Ribbon

COMPLETE SEIKOSHA LINE . . .

		Sugg. Retail	Your Price
PRINTERS			
SP1000I	IBM Parallel	$ 299	CALL
SP1000AS	Epson Serial	299	CALL
SP1000AP	Apple IIc / MAC	299	CALL
SP1000VC	Commodore w/Cable	270	179
SP1200AI	120cps, IBM & Epson	349	CALL
SP1200AS	120cps, Epson Compatible Serial	349	CALL
MP1300AI	300cps, IBM & Epson, Ser & Par	799	389
MP5300AI	300cps, IBM & Epson, Ser & Par	999	CALL
BP5200I	IBM Parallel, 200cps	1080	359
BP5420AI	Epson & IBM, Serial & Parallel	1849	999
SL80AI	24 pin 10" Carriage Epson & IBM	599	CALL
PRINTER ACCESSORIES			
	BP Series Cut Sheet Feeder	$399	$349
	MP1300AI Color Kit	155	125
PRINTER RIBBONS			
	SP Series Cartridge		CALL
	BP Series Cartridge		AND
	MP Series Cartridge – Black		SAVE
	MP 1300 Cartridge – Color		

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Let MidWest Micro help you maximize your profits and minimize your inventory costs. Our exciting prices and delivery schedules will improve your bottom line.
DEALERS CALL 800-528-4504, In Ohio 800-222-6571.

****Special Note**
As you know, whenever possible MidWest Micro publishes unbelievably low prices. However, on this model your savings are so great that our publishing the price might interfere with other marketing channels. Please call today. I guarantee you will be delighted.

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HIGH TECHNOLOGY — NOT HIGH PRICES

Special Daisywheel Printer Sale

MidWest Micro-Peripherals
135 South Springfield Street, Saint Paris, Ohio 43072
Phone (513) 663-5488

Fellow Computer Users,

We have found another excellent printer for you at an unbelievable low, low price. The product is the dependable Star Micronics PowerType Daisywheel Printer and has always been a leader in the daisywheel printer market with its executive quality correspondence capability and its one year warranty.

I feel this is an excellent opportunity for you to get a market leader at a super price of only $199.00. Midwest Micro is proud to offer you this "Super Deal" which backs up our commitment to help you "Save with Confidence." Our friendly, courteous sales staff is anxiously awaiting your call. Please don't delay. Our supply is limited and they won't last long at this exciting low price. Call today to get your PowerType from the price, performance and service leader – MidWest Micro.

Sincerely,

Mark L. Runkle
President

Complete Star Printer Line

Gemini 10X	$179	SD10	$289
NX10	~~$239~~	SD15	$389
NP10	~~$199~~	SR10	$419
NX15	$349	SR15	$499
		NB15	$899

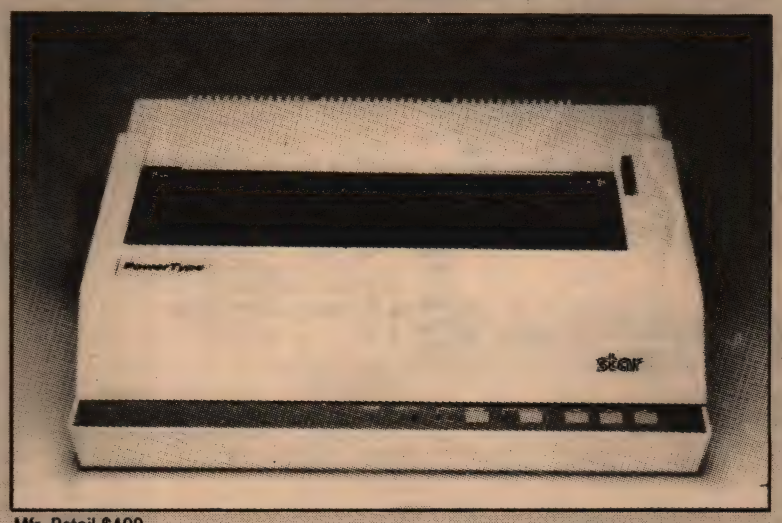
Others.... $CALL$

COMPUTER SHOPPER Best Buy OF THE YEAR

MidWest Micro
Winner of Computer Shopper's Best Buy Award for Impact Printer

star micronics, inc™

POWERTYPE Daisywheel Printer



Mfr. Retail $499

- Fast 18 cps Print Speed
- Both Parallel & Serial Interfaces
- Triple Pitch Selectable
- Uses Drop-in Ribbon Cassettes
- Standard EPSON and Qume Codes
- Short Form Tear-Off
- 1 yr. Warranty
- Nationwide Service by Honeywell

Now Only **$199**

Buy 3 or more **$189**

For crisp, executive quality correspondence here is the opportunity you've been waiting for. Get your PowerType Daisywheel Printer by Star Micronics from MidWest Micro at an unbeatable low price. The PowerType gives you bi-directional printing at a brisk 18 cps. Standard EPSON and Qume codes make it adaptable to virtually all personal computers. It lets you choose a print pitch of 10, 12, or 15 CPI and also offers both parallel and serial interfaces standard. Other special features of the PowerType include: proportional spacing, 32 easy access format switches, short form tear-off and skip over perforation. PowerType is also "typewriter friendly" using a simple drop-in ribbon cassette and Diablo printwheels which saves you time and money. So no matter what your printing needs are, the PowerType from MidWest Micro is the printer for your office or home.

POWERTYPE TRACTOR FEED ONLY $49 **POWERTYPE CUT SHEET FEEDER ONLY $169**

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NEW EPSON FX-86E AND FX-286E PRINTERS

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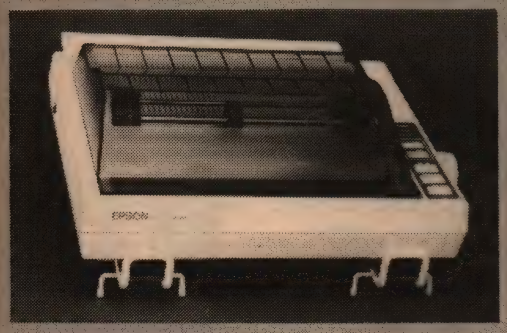
ALL NEW *Epson continues to set the pace in computer printer performance with...*

EPSON FX-86E

LIST $699

Best Prices And Support On Epson Printers In USA!



- NOW WITH FREE FORMS TRACTOR
- 240 cps Draft Mode, 48 cps, NLQ
- SelectType Typestyle Selector
- 8K Internal Print Buffer
- One Year Warranty

YOUR PRICE Too Low To Advertise**

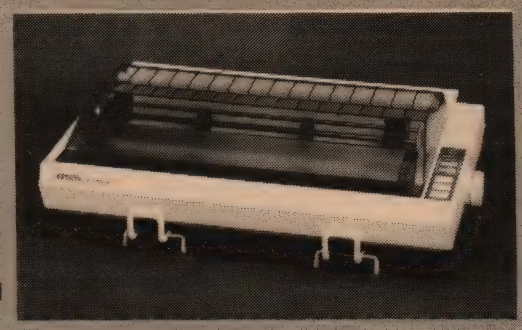
Quite simply the FX-86E is the most intelligent way to print you can find. At a lightning fast 240 cps in draft mode and 48 cps in Near Letter Quality mode, the FX-86E gives you professional versatility. An 8K print buffer speeds up productivity by allowing quicker access to your computer. Plus, for an added measure of creativity, Epson's exclusive SelecType feature gives you finger tip selection of numerous popular typestyles at the touch of a few buttons. The FX-86E is also equipped with pin feed, friction feed, and pull tractor feed as standard. It also accepts optional accessories such as single bin cut sheet feeder, 32K buffer and serial interface boards. And with Epson's one year warranty, you can be sure you're getting the most in quality, dependability and performance.

NEW *From home business to the large corporate user, the Epson FX-286E will help increase your office productivity.*

EPSON FX-286E

OPTIMUM VERSATILITY

- Fast 240 cps Draft, 48 cps NLQ
- 8k Print Buffer
- Dependability with a One Year Warranty
- Both Friction & Tractor Feed



Your Price Too Low To Advertise*

The New Epson FX-286E Printer is a 136 column, 9 wire printer that prints at a fast 240 cps in draft mode and 48 cps in Near Letter Quality Mode to save you time and increase productivity. You also get quicker access to your computer with its built-in 8k printer buffer. The FX-286E features unique single stroke selection of numerous typestyles through Epson's exclusive SelecType feature. Friction feed, tractor feed and built-in parallel interface are standard, as well as unique new features such as Double High Characters, standard Sans Serif Font and Automatic Single Sheet Loading. The new FX-286E also has dual identity; Epson Standard Code for Printers (ESC/P) and IBM Proprinter XL emulation, and both modes are dip switch selectable for compatibility with a wide variety of software applications. You can even print those complicated graphs and charts with the FX-286E's graphic capabilities and the downloadable IBM character sets. The FX-286E accepts optional accessories such as single cut sheet feeder, 32K buffer, and Serial interface boards. Get a hard working business printer designed to give you a powerful advantage in meeting the hectic, high pressure demands of today's business world . . . get the EPSON FX-286E.

COMPLETE EPSON LINE...

PRINTERS		Retail	Your Price
LX-86	IBM Graphics, NLQ, Color Capable	$ 349	$ 229
FX-86e	240cps, 8k Buffer, NLQ, IBM Graphics	599	$CALL$
FX-286e	240cps, Wide Carriage, NLQ, 8k Buffer	749	$CALL$
LQ-800	180cps, 24 Pin, Serial & Parallel I/F	799	$CALL$
LQ-1000	180cps, 24 Pin Wide Carriage	995	$CALL$
LQ-2500	405cps, Ultra-High Speed, 104cps, NLQ	1595	$CALL$
EX-800	300cps Draft, 54cps NLQ	749	$CALL$
EX-1000	300cps Draft, NLQ, Wide Carriage	995	$CALL$

PRINTER ACCESSORIES		Retail	Your Price
LX-80/86	Tractor Feed	$ 35	$ 35
FX-85	Tractor Feed	49	49
FX-85	Sheet Feeder	269	219
FX-286	Sheet Feeder	315	249
LQ-800	Tractor Feed	59	49
LQ-800	Sheet Feeder	129	119
LQ-1000	Tractor Feed	69	59
LQ-1000	Sheet Feeder	189	169
EX-800	Sheet Feeder	199	159
EX-1000/ LQ-2500	Single Bin Sheet Feed	249	219
EX-1000/ LQ-250	Dual Bin Sheet Feeder	399	359
EX-800/1000	Color Module	79	69

Epson Ribbon Cartridges as Low as $3.50 each

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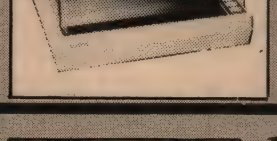
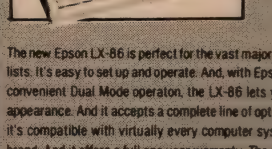
Epson continues to set the pace in computer printer performance with...

ALL NEW EPSON FX-86E LIST $699

- NOW with FREE FORMS TRACTOR
- 240 cps Draft Mode, 48 cps NLQ
- SelecType Typestyle Selector
- 8K Internal Print Buffer
- One Year Warranty



Quite simply the FX-86E is the most intelligent way to print you can find. At a lightning fast 240 cps in draft mode and 48 cps in Near Letter Quality mode, the FX-86E gives you professional versatility. An 8K print buffer speeds up productivity by allowing quicker access to your computer. Plus, for an added measure of creativity, Epson's exclusive SelecType feature gives you finger tip selection of numerous popular typestyles at the touch of a few buttons. The FX-86E is also equipped with pin feed, friction feed, and pull tractor feed as standard. It also accepts optional accessories such as single bin cut sheet feeder, 32K buffer and serial interface boards. And with Epson's one year warranty, you can be sure you're getting the most in quality, dependability and performance.

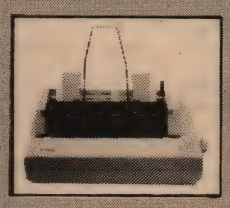


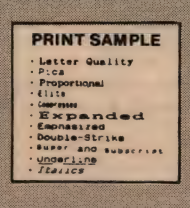
NEW Don't spend a fortune to own the world's most popular printer. . .

EPSON LX-86 $229

The new Epson LX-86 is perfect for the vast majority of your personal and professional printing needs, such as reports, term papers, recipe files or mailing lists. It's easy to set up and operate. And, with Epson's convenient SelecType feature, you can choose from a wide range of typestyles and graphics. With convenient Dual Mode operaton, the LX-86 lets you zip through drafts at high speed, or produce finished copies with a high-quality, typewriter-style appearance. And it accepts a complete line of options for easy, future expansion. Because the LX-86 is made by Epson – the standard of the industry – it's compatible with virtually every computer system made. It inherits a reputation for dependability and durability that's unsurpassed by any other brand. And it offers a full one year warranty. The new Spectrum LX-86 offers a combination of performance and value at a price that's second to none.

EPSON LQ-800 & LQ-1000





Unbelievable $Savings$

- 7K Internal Print Buffer
- One Year Warranty
- 24 Pin Head, 180 cps
- Superb Letter Quality Resolution

The EPSON LQ-800 and LQ-1000 can print at a speedy 180 cps in the high speed draft mode. A speed fast enough to put a typical length business letter in your hands in under 25 seconds. Or for that finished, professional look, switch to the Letter Quality mode at 60 cps. The results will amaze you! Espon's advanced 24 pin print head assures superb resolution page after page. Whether you take it home, use it to help run a small to medium size business, or use it in the corporate environment, the LQ Series makes an excellent choice. And easily installed identity modules let you choose between Extended Epson Graphics, IBM Graphics printer, or Diablo 630 Code. The kind of versatility a growing business demands.

Best Prices And Support On Epson Printers In USA!

EPSON EX-800 & EX-1000 $CALL$ & $SAVE$

- Fast 300 CPS Draft Mode
- Bi-Directional in Text and Graphics
- Optional Color Kit Available
- Built-In Push Tractor Feed

The EPSON EX-800 and EX-1000 is specially designed to handle corporate and small business printing needs easily and efficiently. They print at a speedy 300 cps in draft mode or switch to the near-letter-quality mode for that professional look. The new push button SelecType II font control panel lets you choose from a combination of eight different typestyles. And there is even a user-installable color option kit that adds seven vibrant colors to your text and graphics. The EX Series also provides a built-in push tractor feed that facilitates paper loading and allows short paper tear-off. And as with all Epson printers from MidWest Micro, you get a Full One Year Warranty. Whether you use a printer at home, small business, or the corporate environment, the EX Series makes an excellent choice for virtually all printing tasks.

NEW From home business to the large corporate user, the Epson FX-286E will help increase your office productivity.

OPTIMUM VERSATILITY

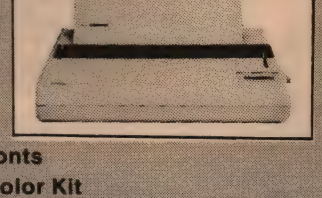
EPSON FX-286E $CALL$ & $SAVE$

- Fast 240 cps Draft, 48 cps NLQ
- Both Friction & Tractor Feed
- 8K Print Buffer
- Dependability with a One Year Warranty

The New Epson FX-286E Printer is a 136 column, 9 wire printer that prints at a fast 240 cps in draft mode and 48 cps in Near Letter Quality Mode to save you time and increase productivity. You also get quicker access to your computer with it's built-in 8K printer buffer. The FX-286E features unique single stroke selection of numerous typestyles through Epson's exclusive SelecType feature. Friction feed, tractor feed and built-in parallel interface are standard, as well as unique new features such as Double High Characters, standard Sans Serif Font and Automatic Single Sheet Loading. The new FX-286E also has dual identity; Epson Standard Code for Printers (ESC/P) and IBM Proprinter XL emulation, and both modes are dip switch selectable for compatibility with a wide variety of software applications. You can even print those complicated graphs and charts with the FX-286E's graphic capabilities and the downloadable IBM character sets. The FX-286E accepts optional accessories such as single cut sheet feeder, 32K buffer, and Serial interface boards. Get a hard working business printer designed to give you a powerful advantage in meeting the hectic, high pressure demands of today's business world...get the the EPSON FX-286E.

Get the Epson Wide Carriage, High-Technology Dot-Matrix Printer...

EPSON LQ-2500



- Ultra High Speed Mode at 405 cps
- Letter Quality Mode at 108 cps
- SelectType III Memory Cells
- Five Resident, Letter Quality Fonts
- Optional User-Installable Color Kit
- Both Parallel and Serial Interfaces
- Prints Bi-Directionally in Text & Graphics

Loaded with innovative technology, the LQ-2500 is designed to cover a wide range of printing tasks. It offers high-speed and dot matrix versatility with true letter quality printing at the touch of a button. For optimum versatility, the SelecType III panel with its 20-character LCD prompts, confirms and stores print modes and print settings through the use of macros. Instant, one-touch selection allows a choice of five letter quality fonts residing in memory. The LQ-2500 has both parallel and serial interfaces making it compatible with virtually every personal computer. The built-in ESC/P Extended IBM-style graphics Character Sets assures compatibility with software written for the IBM PC. It's 8K internal buffer stores four pages of data while you continue to use your computer – a real time saver. And to back our commitment to total value and customer satisfaction, a one year warranty stands behind the Epson LQ-2500 from MidWest Micro.

PRINTER ACCESSORIES

	LIST	YOUR PRICE		LIST	YOUR PRICE
LX-80/86 Tractor Feed	$ 35	$ 35	LQ-1000 Tractor Feed	$ 69	$ 59
FX-85 Tractor Feed	49	49	LQ-1000 Sheet Feeder	189	169
FX-85 Sheet Feeder	269	219	EX-800 Sheet Feeder	199	159
FX-286 Sheet Feeder	315	249	EX-1000/LQ-2500 Single Bin Sheet Feeder	249	219
LQ-800 Tractor Feed	59	49	EX-1000/LQ-2500 Dual Bin Sheet Feeder	399	359
LQ-800 Sheet Feeder	129	119	EX-800/1000 Color Module	79	69
			8148 Serial I/F Board	149	119

CARTRIDGE RIBBONS AS LOW AS $3.50 each

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HOTLINE: 513-663-4992 (For Technical Assistance or Information on Your Order)

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MidWest Micro-Peripherals

135 S. Springfield St., Saint Paris, Ohio 43072

MEMBER DIRECT MARKETING ASSOCIATION

All equipment shipped factory fresh with manufacturers warranty

HIGH TECHNOLOGY — NOT HIGH PRICES

Best Business Printer Buys In U.S.

420 CPS COMREX CR-420 Business Printer MOVES MOUNTAINS

MidWest Micro-Peripherals
135 South Springfield Street Saint Paris, Ohio 43072
Phone (513) 663-5488

Friends,

MidWest Micro has landed for you two of the best continuous duty, business quality printers anywhere. And the values absolutely cannot be beat! Through special arrangements we are able to offer a limited quantity of Comrex CR-4 daisywheel and CR-420 high speed dot matrix printers at unbelievable savings.

These printers are new in factory containers and come to you complete with manufacturers warranty.

Again this is a limited offer and will not be repeated. So call now and "Save with Confidence" to the tune of several hundreds of dollars.

We at MidWest Micro will continue to do our best for you. Thank you for your generous patronage.

Sincerely,

Mark L. Runkle
President

P.S. Don't forget MidWest Micro has the fastest delivery and best after-the-sale support in the business. Call today!

Computer Shopper's Best Buy of the Year

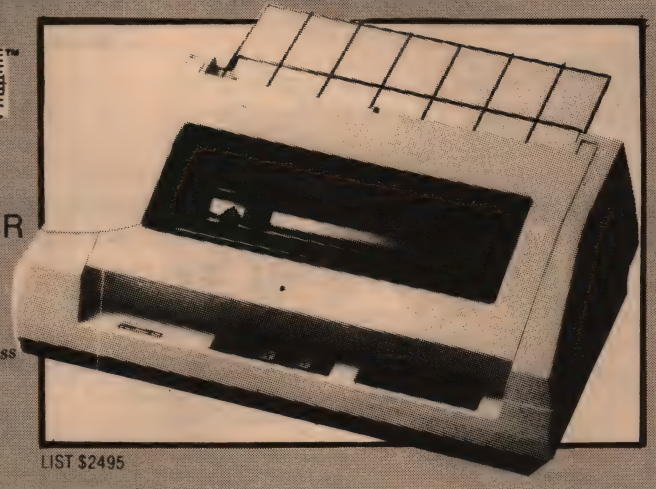
MidWest Micro
Winner of Computer Shopper's Best Buy Award for Impact Printer

COMREX™

CR-420
NOW WITH IBM PRINTER EMULATION!

~~$659~~ *Even Less*

We will match any advertised price! (We offer immediate Shipping and Full Support.)



LIST $2495

This stupendous brute of a printer will make short work of even your largest spreadsheets and reports. You will surprise yourself and amaze your friends and colleagues with this super printer performing in your office. Don't miss out on this one!

CR-420 Ribbon Cartridges $16.95 each
Call for Quantity Savings

SPECIFICATIONS

Carriage Width: 132 Columns (at 10 pitch)

Print Method: Impact dot matrix, bidirectional, logic seeking in both text and graphics

Print Speed: 420 CPS/Draft; 104 CPS/Correspondence Quality; 2500 dots/sec. – standard graphics; 1250 dots/sec – high-density graphics

Print Head: 8-pin, staggered arrangement

Character Sets: Standard 96 ASCII printing in 17 fonts

Line Spacing: n/180 (n=0-255)

Paper Feed: Pin feed (paper width adjustable) and built-in friction feed

Paper Width: 5" to 15" (pin feed); Up to 16" (feed)
Paper Path: Rear and bottom entry

Paper Thickness: Original plus 4 copies (5-part)

Ribbon: Cassette style, single color (black)

Interfaces: Parallel – Centronics-style; and Serial –RS232C Asynchronous

Baud Rate: 1200, 2400, 4800, 9600; switch selectable

Protocols: X-ON/X-OFF, READY/BUSY, ETX/ACK, switch selectable

Buffer: 18K

Reliability: MTBF – 800 hours continuous printing; MCBF – 200 million characters; MTTR – 30 minutes

Power: 117 VAC ± 10%, or, 220 VAC ± 10%, 50/60 H_z

Power Consumption: 55W (Standby); 175W (Operating at self test print); 250W (Operating at heaviest duty)

Environmental Limits: Temperature (operating) 5°-40°C; 40°-105°F; Humidity (operating) 20-80%

Dimensions: 595mm (W) x 194mm (H) x 405mm (D); 23.4" (W) x 7.6" (H) x 15.9" (D)

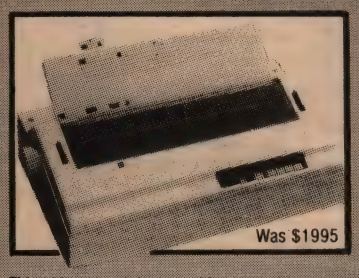
Weight: 27kg; 60 lbs.

CR 420 Ribbon Cartridges $16.95 each BUY 12+ at $13.45 each

36 CPS DAISYWHEEL PRINTER...

Mechanically identical to the Brother HR-35

- **Superior Performance**
- **Fast 36 CPS Print Speed**
- **7K Print Buffer**
- **Continuous Duty Cycle**
- **Wide 16-5" Paper Carriage**



Was $1995

Your Price Just

$399

2+ $369
3+ $349

This bidirectional, logic seeking marvel lets you adjust the hammer intensity to print anything from single-page letters to five-part forms with equal clarity. A variety of impressive typestyles give you added print versatility.

It is exceptional in many other ways. The 15½" wide carriage briskly prints all your ledgers, spreadsheets, and extra wide business graphics with ease. With the optional cut sheet feeder and tractor feeder, you can print several copies on your letterhead and switch to pin-fed paper for high volume word or data processing.

The 7K buffer holds a substantial amount of data while its printing.

The average life of the print wheel is 10 million characters. Which means that you can run it eight hours a day — every day of the week — for almost two full years. Of course, under more normal usage, it will handle your business correspondence and graphics for up to five full years without service. That's impressive.

Quiet quality.
What your eyes don't tell you, your ears will. Because this printer is much quieter than many more expensive printers. So you can keep the noise down while you keep the cost down.

Specifications

Print Speed	36 CPS (Shannon text)	Interface	Standard RS-232C – Serial
Print Wheel	96 petals/wheel, cassette type, ASCII stand.		
Print Wheel Life	10 million char./wheel	Buffer Size	7K
Characters/Line	132 characters (1/10"), 158 characters (1/2"), 198 characters (1/15")	Control Panel	Indicators: Select, Power, Alarm, Line, Pitch, and Copy (LEDs) Switches: Select, Line Feed, TOF, Line, Pitch, and Copy
Paper Width	16.5 in max (419 mm)		
Copy Capacity	Original (45 kg) + 4 copies (15 kg) (total thickness 0.35 mm max.)	Noise	Operating – Less than 65 dB
		Temperature	50 to 105 F – 10 to 40 C (operating)
Carriage Motion	Bidirectional, logic seeking	Humidity	20% to 80% non-condensing (operating) 5% to 90% non-condensing (storage)
Carriage Rtrn Speed	750 ms (at 13.2" return)		
Line Spacing	6, 4, 3 lines/inch, 1/48" proportional increments	Power	120 V, 60 Hz (Optional: 120 or 220 - 240 V, 50/60 Hz) 130 W Max.
Paper Feed	Bidirectional, logic seeking		
Paper Feed Speed	4"/second	Dimensions	21.18 (W) x 7.65 (H) x 15.15 (D) inches (538(W) x 194.5 (H) x 385 (D) mm)
Available Ribbons	Ribbon Life		
Single-strike black carbon film	60,000	Weight	33 lbs (15 kg)
Multi-strike black carbon film	150,000	Optional Features	Tractor feeder, Auto Cut Sheet Feeder, Single and Multi-strike ribbons, Interchangeable printwheels (Numerous languages and typestyles)
Single-strike black correctable film	70,000		
Multi-strike black fabric	500,000		
Single-strike red film	2,000		
Correction tape	1,500		

RIBBON CARTRIDGES ..... As Low As $2.79 each
FORMS TRACTOR (Fits CR-4, Datasouth DW-36, Brother HR-25/35) ..... $119 each
AUTO CUT SHEET FEEDER (Fits CR-4, Datasouth DW-36, Brother HR-25/35) ..... $129 each

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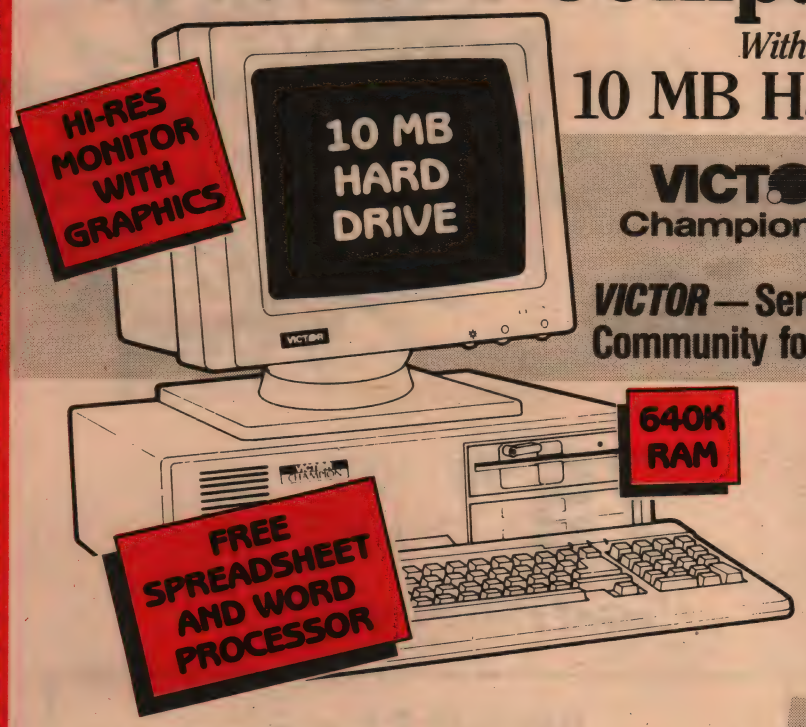
100% IBM Compatible PC

With

10 MB Hard Drive



VICTOR Champion PC

***VICTOR*—Serving the Business Community for 68 Years**

ONLY $999

Why risk your money on a no-name clone when you can get a quality brand name, warranted computer, with 10 MB hard drive, monitor, and free software for about the same price!

- 640K RAM
- 10 MB Hard Disk Drive
- 1 360K Floppy Drive
- Monochrome Graphics Adapter—Hercules Compatible
- Hi-Res 12" Green Monochrome Monitor w/Graphics Capabilities (Resolution: 720 x 349 Pixels)
- 5 Full Length Expansion Slots—3 Standard 8-Bit Slots and 2 16/8-Bit Slots
- AT-Style Detached Keyboard
- 8086-2 Processor Running at 4.77 MHz—Faster Than IBM PC
- Socket for 8087 Math Coprocessor
- Parallel and Serial Ports
- MS-DOS 3.1, VBASICA (Enhanced GW Basic) Included
- CalcResult Spreadsheet and WordResult Word Processor by Handic
- 1 Year Warranty

PC MAGAZINE

"The latest offering from Victor Technologies is probably the best home-market PC compatible. . ."*

***Note:** The unit evaluated by PC Magazine was equipped only with 1 floppy drive, did not include a monitor, and listed for $799.00 We offer an even better system, with a hard disk controller card, a 10 megabyte hard disk drive, and a high resolution monochrome monitor—for only $999

FREE SOFTWARE!

Integrated Software by **HANDIC**

CalcResult Spreadsheet

- 3 Dimensional Spreadsheet—32 Pages by 256 Rows by 64 Columns
- Can Also Create Spreadsheet Up to 8172 Rows by 64 Columns or 2048 Columns by 256 Rows
- Windows and Split Screens—Allows Access to Up to 4 Pages at a Time
- Commands and Help Screens in 10 Languages—English, Dutch, French, German, Spanish, Italian, Norwegian, Danish, Finnish and Swedish

Word Result Word Processor

- Easy to Use Logical Commands
- Built-In Macro Commands—Save Repetitive Keystrokes
- On Screen Formatting—Underlining, Bolding, Centering, etc.
- Mail Merge Functions

- Split Screen For Simultaneous Access to Word Result and CalcResult
- Integrate Spreadsheet Figures and Graphs into Word Processor Documents
- Integrate Word Processor Text into Spreadsheets

100% Satisfaction Guarantee

1 year warranty from Victor plus 15 day trial. If you are not satisfied with this computer for any reason, simply call to return it within 15 days of receipt for a complete refund.

Ordering Information

Product #	Item	Price	Ship./Hand.
VC640-C4	Victor Champion PC	$999	$39

Order Toll Free or Send Check or Money Order

COMPUTERS

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1-800-545-7447

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Product Information

1-202-944-3900

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We ship anywhere in the continental US by UPS ground. Please allow three weeks shipping time. Quantities of all items are limited, prices subject to change without notice. We accept major credit cards, company and personal checks, and money orders. We accept purchase orders from schools, churches and Fortune 1000 companies. Sorry, no C.O.D. orders. **All returns must have prior authorization** from our Customer Service department (1-800-231-3549). All returns must be in like-new condition and in original packaging. Unauthorized returns and refused shipments are subject to a 20% restocking charge

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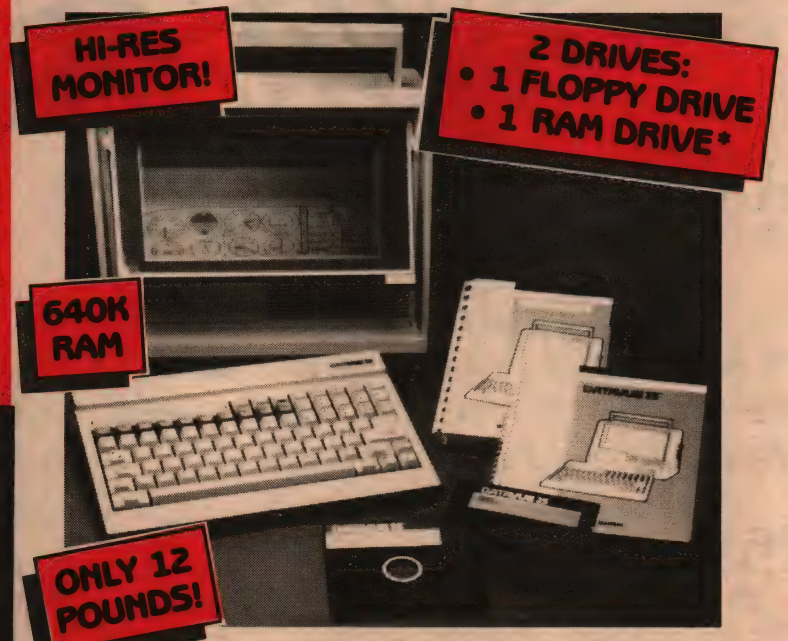
100% IBM Compatible Laptop PC



COMPUTERS

QUADRAM DATAVUE™ 25

***Built-in RAM Disk functions as a second disk drive—only faster!**

- Refurbished by Quadram, Full Manufacturer's Warranty
- 640K Ram
- 5¼" 360K DSDD Floppy Drive **plus** High Speed RAM Disk
- Runs All IBM Compatible Software
- High Resolution Adjustable LCD Screen
  - — CBA Graphics Compatible
  - — 80 Columns x 25 Rows Text
  - — 640 x 200 Pixels Hi-Res Graphics (Does not Have External Monitor Output)
- Detached Keyboard
- Parallel and Serial Ports
- Operates on AC Power or Optional Battery Pack
- Clock/Calendar
- 90 Day Manufacturer's Warranty

NOW ONLY $499

Mfr. Retail ~~$1995.00~~

75% OFF LIST!

Lowest Priced Laptop!

Why Such A Bargain?

The Quadram Datavue 25 is 100% IBM compatible, has 640K RAM, weighs only 12 pounds, and takes up less space on your desk than a typewriter.

Standard equipment includes one floppy drive plus a built-in RAM disk that functions like a second disk drive—you just load your program using the floppy drive and transfer it into the RAM disk. You can then run your program at lightning speed and use the floppy drive to store your data.

It also features a detached keyboard and a high resolution adjustable LCD screen capable of both text and graphics. Options include a rechargeable battery pack, a carrying case, a second floppy drive and an internal modem.

So how can we sell it for only $499? The answer is simple.

Recently, Quadram introduced several newer versions of the Datavue 25 computer. They offered owners of the original Datavue the opportunity to trade in their computers, for a fee, for the later models.

Quadram refurbished the traded-in computers, and arranged for us to resell them. They are in excellent condition, fully tested and inspected by Quadram's skilled technicians. They are in about the same condition as a new computer that has been used for a few weeks. Each computer comes complete with new documentation and software.

And they are covered by the same warranty that Quadram gives their brand new computers as well as our 15 day 100% satisfaction guarantee. What could be more fair?

Options Available

- Rechargeable Battery Pack
- Carrying Case
- Second Disk Drive
- Keyboard Cable
- Hayes Compatible 1200 bps Internal Modem

Available only with purchase of computer.

See ordering information for prices.

100% Satisfaction Guarantee

All refurbished Quadram Datavues come with 90 day warranty from Quadram plus 15 day trial. If you are not satisfied with this computer for any reason, simply call to return it within 15 days of receipt for a complete refund.

Ordering Information

Product #	Item	Price	Ship./Hand.
QD64R-C4	Refurbished Quadram Datavue 25 Computer	$499	$15
QB100-C4	Datavue Battery Pack	$59	$5
QC200-C4	Datavue Carrying Case	$45	$5
QF400-C4	Datavue External Floppy Drive	$199	$9
QM120-C4	Datavue 1200 bps Internal Modem	$329	$7
QK300-C4	Datavue Keyboard Cable	$15	FREE

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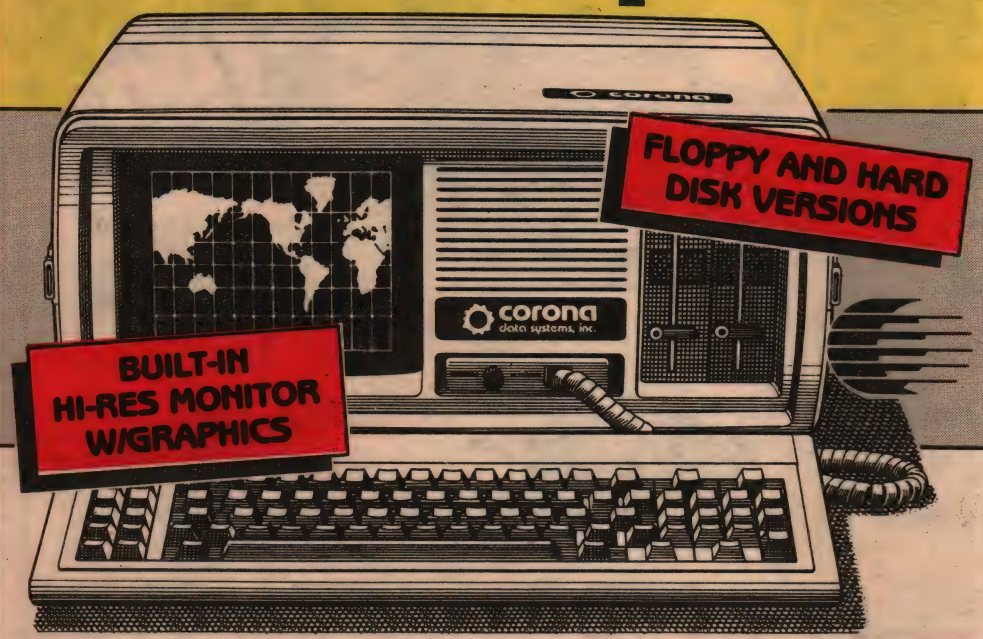
Liquidation!
100% IBM Compatible Portable Computers!

UP TO 61% OFF LIST



From $799

cordata PC
PC400 Series

Formerly corona data systems, inc.

- 9" High Resolution Green Monitor
  640 x 400 Pixels in Graphics Mode
  80 Columns x 25 Lines in Text Mode
- 8088 Processor
- Detached Selectric Style Keyboard
- 4 Full Length Expansion Slots
- Serial and Parallel Ports
- MS-DOS 2.11, GW Basic and PC Tutor Included
- 110 Watt Power Supply

100% Satisfaction Guarantee
All Cordata hardware is covered by the manufacturer's 90 day warranty. All additional disk drives are covered by their own individual warranties. Plus, if you are not satisfied with any system for any reason, simply call within 15 days of receipt to return it for a complete refund.

Best Buy OF THE YEAR

Our earlier version of the Corona PC, model PC325, was voted Computer Shopper's "Best Overall Buy" of 1986, based on a subscriber survey.

Now we've got an enhanced version, model PC400, with built-in monochrome graphics for only $49 more! Plus hard drive systems! Your Best Buy in 1987!

System C — **$799**
- 256K RAM on Motherboard
- 2 Half Height Floppy Drives

System D — **$849**
- 512K RAM on Motherboard
- 1 Half Height Floppy Drive—
  Space Available For an Additional
  Half Height Floppy or Hard Drive

System E — **$929**
- 512K RAM on Motherboard
- 2 Half Height Floppy Drives

System F — **$1099**
- 512K RAM on Motherboard
- **10 MB Half Height Hard Drive**
- 1 Half Height Floppy Drive

COMPUTERS

Ordering Information

Product #	Item	Price	Ship./Hand.
CR403-C4	Corona PC400 Portable—System C	$799	$23
CR404-C4	Corona PC400 Portable—System D	$849	$23
CR405-C4	Corona PC400 Portable—System E	$929	$23
CR406-C4	Corona PC400 Portable—System F	$1099	$23

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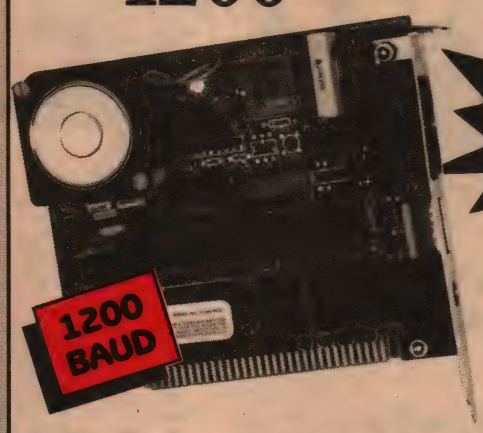
BCE High Quality Modems!

Lowest Prices Anywhere!

MODEMS

Brand Name Hayes Compatible Modems!

1200 Baud Internal Modem



ONLY $99

Comparable Price ~~$549.00~~

By AMAZING

An Incredible Price on a High Quality Modem!

For IBM PC, XT, AT and Compatibles

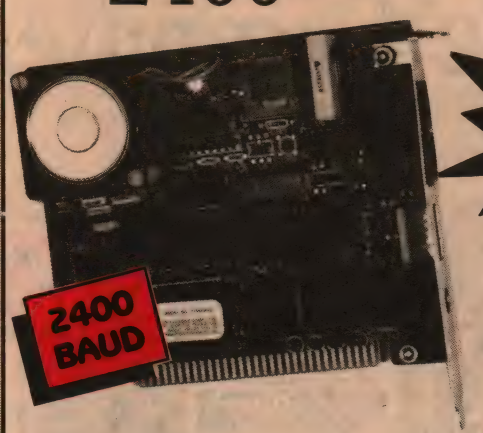
Runs SmartCom, CrossTalk, PC-Talk and Many More!

2 Year Warranty!

- 1200-300 bps Data Transmission
- Half Card Internal Modem
- Compatible with IBM PC, XT, AT and Compatibles
- AutoDial/AutoAnswer
- Asynchronous Data Transmission
- Dual Telephone Jacks
- Bell 212A/103A Compatible
- RJ11 Telephone Cord Included

BitCom Communications Software Included!

2400 Baud Internal Modem



ONLY $199

Comparable Price ~~$739.00~~

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High Speed Communications at an Amazing Price!

For IBM PC, XT, AT and Compatibles

Runs SmartCom, CrossTalk, PC-Talk and Many More!

2 Year Warranty!

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- Half Card Internal Modem
- Compatible with IBM PC, XT, AT and Compatibles
- AutoDial/AutoAnswer
- Asynchronous Data Transmission
- Dual Telephone Jacks
- Bell 212A/103A Compatible
- RJ11 Telephone Cord Included

BitCom Communications Software Included!

100% Satisfaction Guarantee

All products covered by manufacturer's warranty plus our 15 day trial. If you are not satisfied with these modems for any reason, simply call us within 15 days of receipt to return it for a full refund.

Ordering Information

Product #	Item	Price	Ship./Hand.
AM1200-C4	Amazing Things 1200 Baud Modem	$99	$5
AM2400-C4	Amazing Things 2400 Baud Modem	$199	$5

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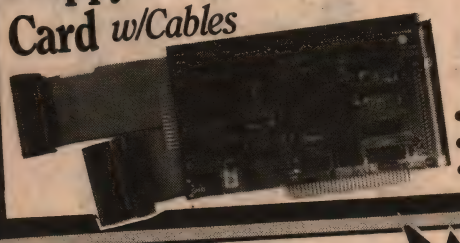
New Low Prices!

Floppy Disk Controller Card *w/Cables*

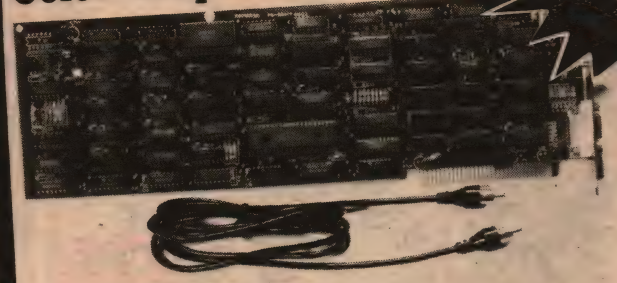
$24



- Controls 2 Floppy Drives
- Half Card
- 1 Year Warranty

Color Graphics Card (CGA)

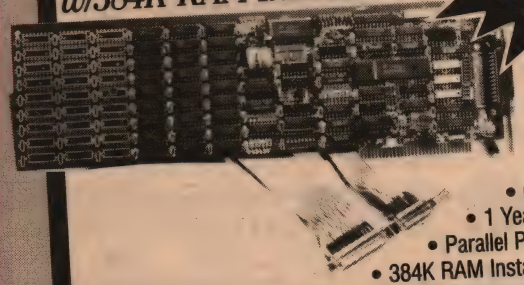
$49



- 4 Operating Modes
  - 80 Column x 25 Rows High Resolution Text
  - 40 Column x 25 Rows Low Resolution Text
  - 320 x 200 Pixels Medium Resolution Color Graphics
  - 640 x 200 Pixels High Resolution Text
- 4 Video Interfaces
  - 2 Composite Video Ports—One for Color Monitor and One for Monochrome Monitor
  - RGB Port
  - Interface for User Supplied RF Modulator
- Light Pen Interface
- 1 Year Warranty

384K Multifunction Card *w/384K RAM Installed!*

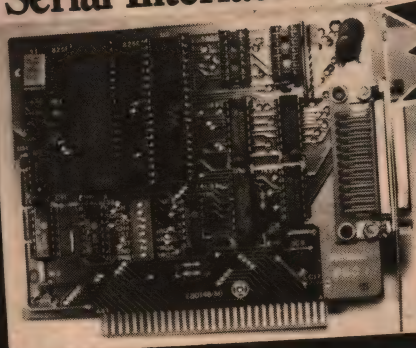
$72



- 200 ns
- Serial Port
- Game Port
- 1 Year Warranty
- Parallel Printer Port
- 384K RAM Installed (Soldered Chips)
- Real Time Clock/Calendar with Battery Backup

Serial Interface Card

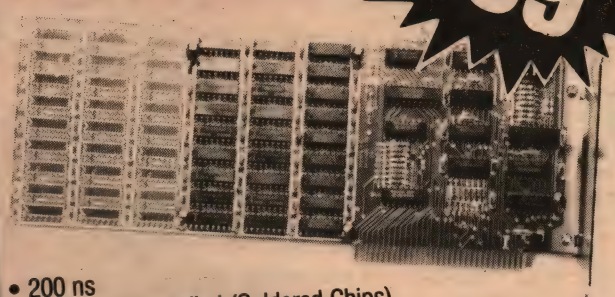
$23



- Half Card
- RS232-C Interface
- 1 Year Warranty

384K RAM Card *w/ 384K RAM Installed!*

$39



- 200 ns
- 384K RAM Installed (Soldered Chips)
- 1 Year Warranty

Parallel Printer Card *w/Centronics Cable*

$29

- Half Card
- 1 Year Warranty

EXPANSION BOARDS

100% Satisfaction Guarantee

1 year manufacturer's warranty plus 15 day trial. If you are not satisfied with any of these boards for any reason, simply call within 15 days of receipt to return them for a complete refund.

Ordering Information

Product #	Item	Price	Ship./Hand.
LC111-C4	Color Graphics Card	$49	$5
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LC333-C4	384K RAM Card	$39	$5
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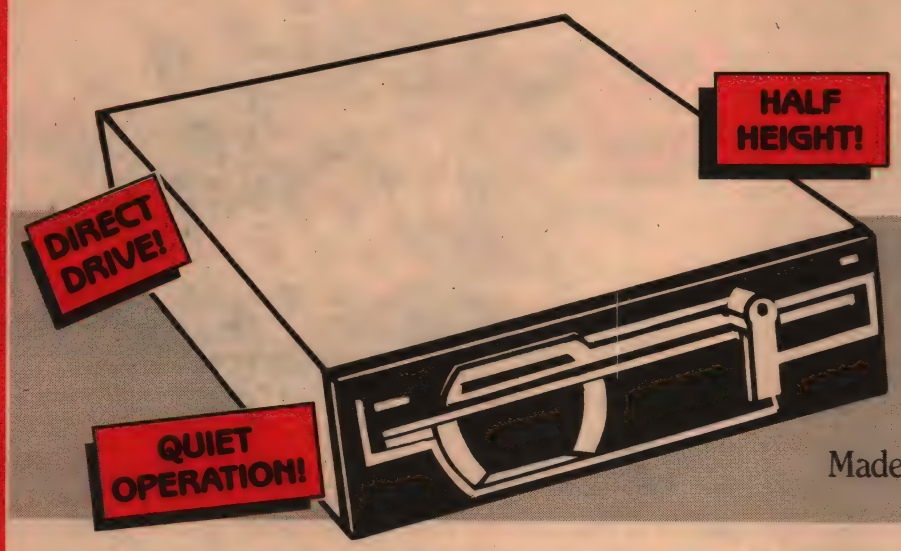

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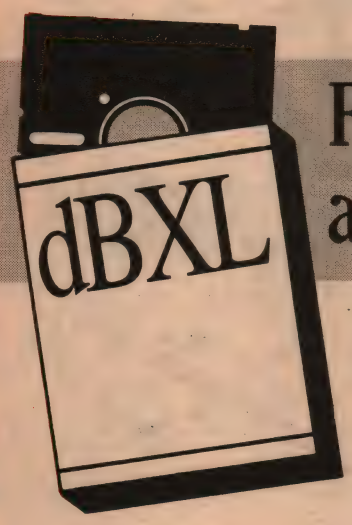

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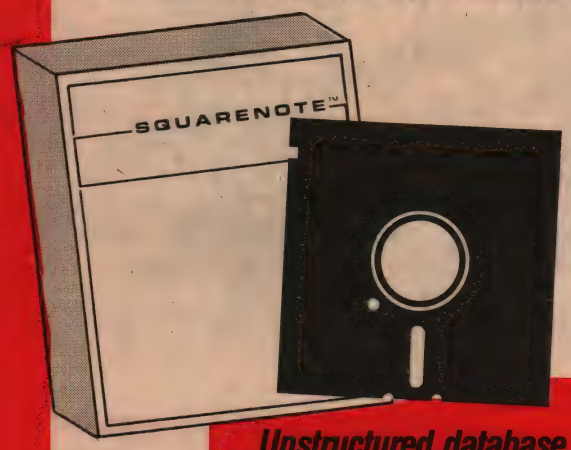

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Unstructured database for text: SquareNote lets you make a database out of any collection of notes or documents!

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What is SquareNote?

SquareNote combines features from database managers and word processors, making it ideal for handling large amounts of textual information.

SquareNote is a free-form unstructured text based management system which lets you write, store, maintain and retrieve notes or documents of up to 10 pages each, just as you would in a box of 3x5 index cards or in a filing cabinet. Except **SquareNote** is much more powerful. Using it, you can file *each* note or document under up to 100 different subjects (the total number of subjects is limited only by available disk space.) And you can instantly locate any document by specifying the subject or combination of subjects it is filed under—or even by specifying any word or group of words in the document.

You can incorporate documents you already have typed on a word processor into a **SquareNote** file. Or you can type in new documents using the system's built-in full screen text editor which includes features such as insertion, deletion, tabbing, automatic word wrap and underlining. And you can move documents from **SquareNote** into already existing documents that are not filed under the system, and even edit documents that are filed under this system using an independent word processor.

How is SquareNote Different from other Database Programs?

Most database programs are extremely structured and require you to use predefined fields. **SquareNote** is an extremely **flexible** database system designed specifically for documents or notes. It doesn't require you to use structured fields or know in advance how long your entries will be.

Databases don't let you organize notes or textual materials. **SquareNote** allows you not only to index but retrieve notes on a variety of subjects.

A database requires fixed fields—the **SquareNote** text based management system allows you to just type in a document the way you normally would type a note, letter, article or report using any format you want.

You can retrieve information easily and quickly under a variety of subject categories, or you can locate a document by searching all the selected documents for a particular word or string of text.

How Does SquareNote Work?

SquareNote lets you file documents up to 10 pages long (called "notes") under subject you select. You can file each note under up to 100 different subjects—the total number of categories is limited only by available disk space. To file a note under one or more subjects, you simply type the subject names in a special section at the top of the note file—these subject names then become "keywords."

To call up stored notes, you simply specify one or more keywords. For convenience all the keywords from all the notes are displayed in an easy to use index. Once you specify a keyword, all the notes containing that keyword are then called up. Five of the activated notes are displayed on the screen as a stack of papers with the top 3 lines showing. You can scroll up and down through the entire stack, or view the entire contents of any note.

Another way to retrieve notes is to use a simple fill-in form with spaces for keywords connected by AND and OR. For example, you could retrieve all notes indexed either by the keywords "hardware" or "software" or you could retrieve only the notes that were indexed by both keywords. Or once you're in a particular stack of notes you can bypass the keyword system entirely by telling **SquareNote** to search through all the notes for a particular word or string of text.

Can I Use SquareNote with my Word Processing Program?

Yes! **SquareNote** notes can be moved into a word processing document. This saves valuable time for researchers, and students when converting notes into a finished paper.

But, that's not all! If you've already typed something that you'd like to organize with **SquareNote**, you can just insert some simple commands into your document—and **SquareNote** will recognize it as a note and incorporate it into the system.

Can I Use SquareNote to Organize Handwritten or Typed Notes?

Yes, **SquareNote** can be used to organize handwritten or typed notes that you don't want to type into your computer. For example, if your notes are in notebooks or on loose sheets, you can simply number the notebooks and use **SquareNote** to index them by subject matter.

What Other Features Does SquareNote Have?

An easy to use menu driven format lets you customize the appearance of your printed output.

SquareNote also offers several powerful global operations. You can replace or delete a keyword in your keyword index, and **SquareNote** will replace or delete that word in every note in the file. And you can sort any stack of notes by the first line of text in the note.

Who Can Use SquareNote?

SquareNote is very versatile.

People who use **SquareNote** include . . .

Teachers, who have used it to keep track of exam questions and assignments, categorized by subject and level of difficulty.

Salesmen, who have used it to organize telephone contacts or piles of business cards collected at meetings or conventions, and classify these contacts according to their interest.

Students and researchers, who have used it to organize lecture notes, lab notes and reading notes.

Personnel agents, who have used it to match prospective employees' resumes with company profiles.

Some Other Features

The **SquareNote** distribution disk is not copy protected, so you can use it on your hard disk. The disk also includes two sample **SquareNote** data files, so you can see exactly how **SquareNote** works before you enter your own data.

The 64-page manual has a tutorial section, a full reference section, and a quick reference section, so it is ideal for the beginner or the experienced computer user.

SquareNote has complete on-line help screens to help you out of problems, and **SquareNote** comes with free telephone support for more extensive help.

SquareNote works on any IBM PC or compatible, and works with standard monochrome graphics cards, and CGA and EGA color graphics cards.

Some Comments from Users:

"**SquareNote** has been a major help in getting control of 15 years of research and publication." —Carter Radcliffe, New York

"**SquareNote** has freed me from a lifelong addiction to 8x5 cards. It is a delightfully easy program to use." —Peter Cousins, Museum Curator, Michigan

"This program saved my neck when faced with teaching two new courses and two months to prepare. **SquareNote** gathered all the essential research, organized it and even printed out my lecture notes. A basic, essential tool for anyone doing research." —E.C.S., Ilion, New York

"I'm impressed by its accessible, intuitive structure; it speeds up the process that I used to organize material in my dark pre-computer days. It feels 'natural' to someone whose habits are only semi-logical." —William Millard, New Jersey

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"SquareNote is an efficient program capable of satisfying anyone who wants a free-form TBMS (Text Based Management System) for maintaining notes."

"It will do what you want it to—maintain a database and retrieve records as fast as possible."

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"Mirror is an incredible buy—it gives you so much for so little money. It is a singular pleasure to review a product such as this. All PC users who need to communicate with another computer should buy it."
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PC Products
"A Crosstalk twin that is complemented by a lower price tag, better documentation and a respect for hard disks... Mirror offers more than 25 enhancements to Crosstalk."
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*Major users of **Mirror** include AT&T, General Motors, Dupont, RCA, TRW, IBM, NASA and the U.S. Government.*

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MR139-C4	Mirror Communications Software	$39	$5

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- 10 Memories
- Dollars & cents mode

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DeskSet Plus
Includes *Pop-Up DeskSet*
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- Sends and receives binary and text files
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Pop-Up DeskSet Plus was also selected as the *PC Magazine* **Editor's Choice** Desktop Organizer in the May 27, 1986 issue.

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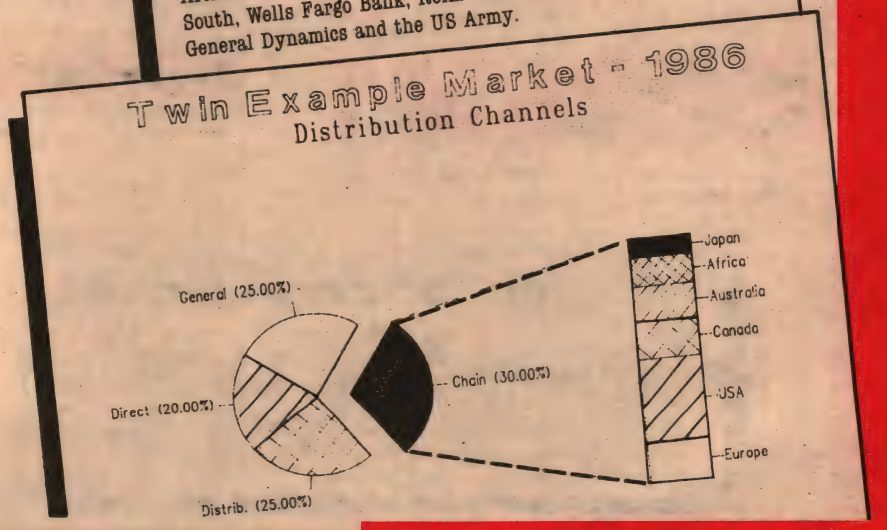
—PC Magazine, August 1986

"Anyone who uses release 1A of 1-2-3 would be completely at home working with Twin."

—PC Week, May 6, 1986

Users of Twin include GE, 3M, Westinghouse, Arthur Anderson, Conoco, Dupont, Boeing, Bell South, Wells Fargo Bank, Rolm Corporation, General Dynamics and the US Army.



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Unprecedented! We Trust You!

If you are not completely satisfied with this software after a 15 day trial, simply call us to return it for a complete refund.

Ordering Information

Product #	Item	Price	Ship./Hand.
LE123-C4	Twin Spreadsheet	$39	$5

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Monday - Friday, 9 AM–8 PM Eastern

Product Information
1-202-944-3900

Customer Service
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By MOSAIC SOFTWARE INC.

All the modules of Ashton-Tate's Framework or Lotus Symphony at a fraction of the cost!

For IBM PC's and Compatibles

Includes Twin Spreadsheet
(See ad on opposite page.)

~~*Symphony* $695.00~~

~~*Framework* $695.00~~

FROM $59

INTEGRATED 3

1 *Twin Spreadsheet*
Lotus 1-2-3 Look-Alike
(See ad on opposite page.)

2 *Word Processor*
(See description below.)

3 *Presentation Quality Graphics*

ONLY $59

INTEGRATED 7

- Extremely Easy to Use Menu-Driven System
- Not Copy Protected
- Supports the 8087 Math Co-processor
- Supports Dual Monitor Displays, so Graphics Can be Displayed on a Color Monitor while Text is Displayed on a Monochrome Monitor
- Access DOS Commands from Within the Program
- Previously Sold for Up to $695.00
- System Requirements: IBM PC, XT or Compatible, 2 Disk Drives, 320K Available Memory, Monochrome or Color Graphics Adapter and Monitor

1 *Twin Spreadsheet*
Lotus 1-2-3 Look-Alike
(See ad on opposite page.)

2 *Word Processor*
- 35,000 Word Dictionary
- Search and Replace Functions
- On-screen Bolding and Underlining (Will not underline on-screen with graphics card and monochrome monitor)
- Automatic Paragraph Realignment
- Integrates Graphics and Spreadsheet Data into Documents
- Access Another Application while Still In Word Processor
- Import Data from Database and Spreadsheet
- Justifies Left Margin, Right Margin or Both

3 *Relational Database Manager*
- Handles up to 100,000 Records per File
- Sort Files on Multiple Keys
- Allows 2 Files to be Merged—Symphony Can't
- Stores Data on Disk, Not in RAM Like Many Databases

4 *DataMail*
- Merges Database Files with Word Processor Documents for Mass Mailings—Symphony and Framework Don't Have This Capability

5 *Presentation Quality Graphics*
- All the Outstanding Graphics Features of Twin *(See ad on opposite page.)*

6 *Terminal Emulation*
- Emulates IBM 3101, DEC VT-52, DEC VT-100 Terminals for Access to Mainframe Databases

7 *PC-to-PC Communications*
- Communications Up to 9600 Baud—Symphony and Framework Only Go Up to 1200 Baud
- Supports Hayes and Hayes Compatible Smart Modems, and Other Modems

ONLY $79

Both General Motors and NASA selected Integrated 7 as their sole integrated software package at a time when Integrated 7 retailed for $495.00.

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Ordering Information

Product #	Item	Price	Ship./Hand.
MI333-C4	Integrated 3 Software Package	$59	$6
MI777-C4	Integrated 7 Software Package	$79	$8

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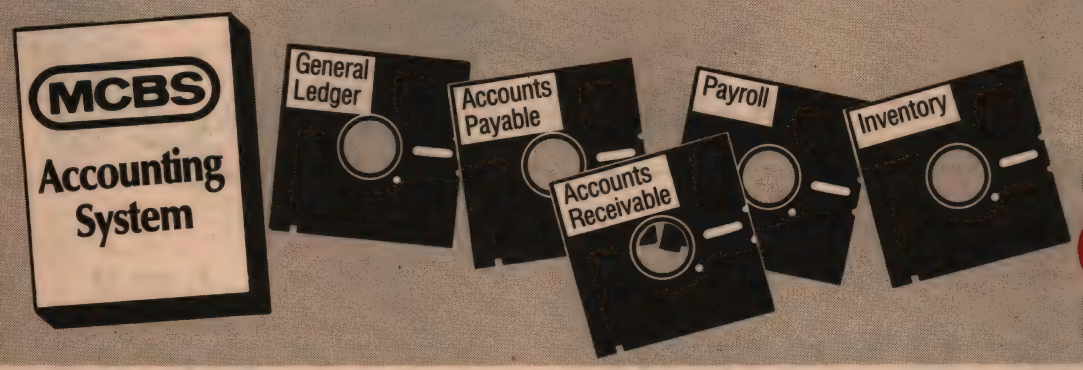
BCE Accounting Software

Lowest Prices Anywhere!

Complete Integrated Accounting System with Payroll

For IBM PC's and Compatibles

Complete System $39



Made by MCBS Micro-Computer Business Services

Previously sold for over $300 per module!

All 5 modules for a fraction of the cost of one module of a comparable system!

All these features and many more!

General Features
- Automated start-up and installation procedures minimizes use of DOS commands.
- Menu driven system.
- Creates subdirectories and copies all files to fixed disk when used with fixed disk.
- Simplified installation.
- Complete audit trails.
- Data files can be accessed by Lotus, dBase, etc.
- Create as many copies of the manual as you like from the diskette.
- Not copy protected, can be used on hard disk.
- Accounts and transactions limited only by disk space.

General Ledger
- Supports multiple departments.
- Flexible charts of accounts.
- Prints financial statements in flexible user defined formats.
- Prints Income Statement and Balance Sheet by current month, current quarter, and previous 3 quarters.
- Prints Departmental Income Statement and Balance Sheet by current month, current quarter, and previous 3 quarters.
- Prints Trial Balance and chart of accounts.
- Data Entry screen displays beginning, current and ending balances as well as the last 10 entries.
- System allows new accounts to be created during data entry.

Accounts Receivable
- Customize your own headings on Invoices and Credit Memos.
- Add finance charges at the rate you choose to accounts you wish to charge.
- Provides for entry, updating, and deletion of customer information.
- Allows entry, editing, and posting of receivables, credit memos, and cash payments.
- Prints the open items and aged receivables report.
- Prints Invoices, Credit Memos and Statements.
- Supports partial payments.
- Prints Invoices, Payment and Credit Memo Registers.

Accounts Payable
- Vendors may be added to the system during the entry of invoices.
- Provides for entry, updating and deletion of vendor information.
- Allows entry, editing, and posting of payables, adjustments, cancellations, and prepaids.
- Prints A/P checks.
- Prints check register.
- Prints the A/P distributions to the General Ledger.

Payroll with State & Local Taxes
- Prints W-2 and 1099-Misc forms information.
- Handles hourly, salaried or commissioned employees on weekly, biweekly, semi-monthly or monthly pay periods.
- Calculates Federal, State, and Local taxes.
- Allows user to maintain all tax tables.
- Calculates the payroll.
- Prints the payroll register, check register, and deduction register.
- Prints payroll checks.
- Prints W-2's, 1099's, and quarterly earnings reports.

Inventory with Order Entry & Purchase Orders
- Adds customers, vendors, or items without leaving the entry screen you are working with.
- WILD CARD customer feature allows creation of walk-in customer account for Point of Sale invoicing.
- WILD CARD item allows for billing miscellaneous non-inventory charges.
- Provides for order entry and editing with inventory update during entry.
- Stock and non-stock items.
- Handles purchases, returns, shipments and adjustments.
- Prints on preprinted forms or plain paper.
- Prints invoices, credit memos, picking tickets, purchase orders, price lists, and shipping labels.
- Performs book to physical analysis.

The MCBS Accounting System comes with complete documentation stored on disk for you to print out on your printer. It is also available with a pre-printed manual.

Random House has recently selected MCBS's 5 Module Accounting System from several systems evaluated to distribute with their line of college and university accounting textbooks.

Over 12,000 satisfied customers have purchased the MCBS Accounting System at prices up to $300 **per module** and more! Now, through a special arrangement with MCBS, you can get all 5 modules for only $39!

"This is excellent accounting software!"
—William R. Golden, President
Texas Association of Public Accountants

"I would recommend this accounting software to anyone."
—Charles Hereford, CPA
Hereford, Lynch & Company

Ordering Information

Product #	Item	Price	Ship./Hand.
MC539-C4	MCBS Accounting Software	$39	$6
MC652-C4	MCBS Accounting Software w/Pre-printed Manual	$44	$6

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BCE WINNER OF COMPUTER SHOPPER MAGAZINE'S Best Buy OF THE YEAR BEST OVERALL BUY

Lowest Prices Anywhere!

Complete Business Graphics Package!

ONLY $39

CHARTMAN

From MOSAIC SOFTWARE INC.

~~Mfr. Retail $99.00~~

For IBM PC's and Compatibles

- Chartman offers significantly more types of charts than other programs.
- "Fill-in-the-Blanks" Input Forms make Chartman the easiest to use.
- Also imports data from ASCII and DIF files.
- On screen HELP.
- Multiple charts on one page.
- Plots on paper or transparency.
- On screen SLIDE presentation feature.
- Supports color monitors (or high resolution monochrome monitors with color emulation), IBM printers, HP plotters and compatibles.

"Unbelievable..."

"The graphics capabilities of 1-2-3 are limited... Other dedicated IBM PC graphics packages, such as the outstanding CHARTMAN II, offer these capabilities and more."

"A complete graphics package."

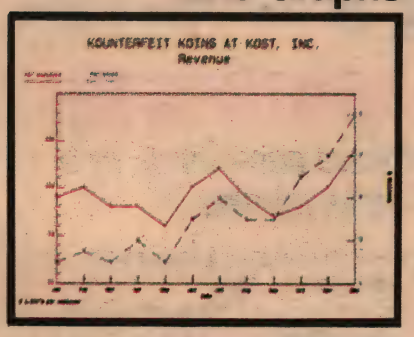
"CHARTMAN's easy-to-use and effective installation program is typical of the entire package."

—PC Magazine

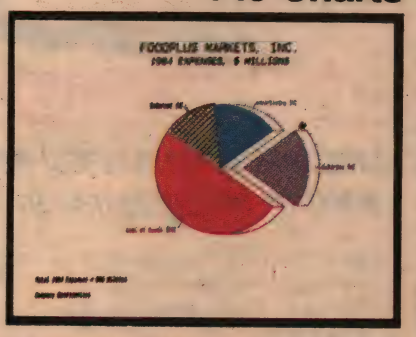
Software Digest

Software Digest recently ranked Chartman second in a field of 17 business graphics packages, trailing only a product priced significantly higher.

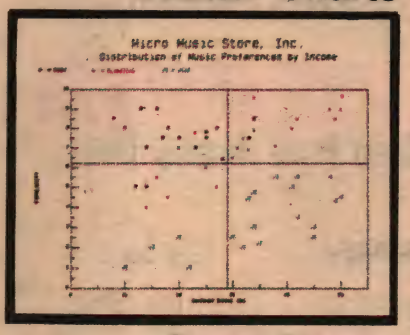
Line Graphs



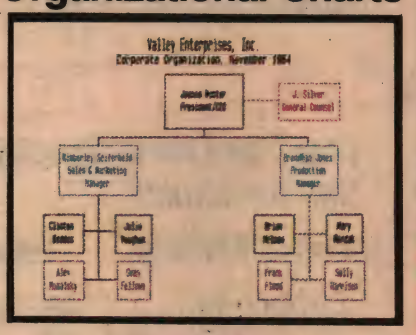
Pie Charts



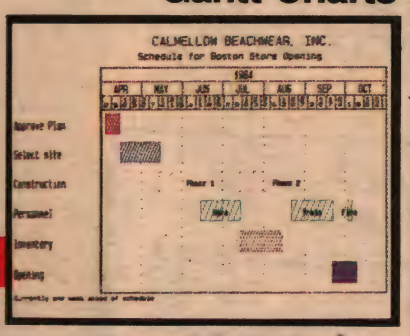
Scatter Charts



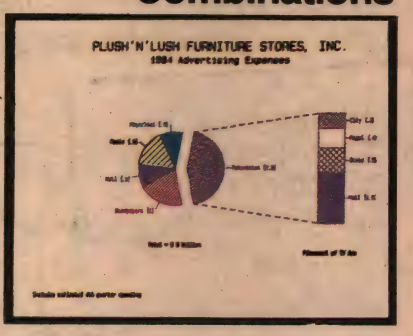
Organizational Charts



Gantt Charts



Combinations



And Many More . . .

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Lowest Prices Anywhere!

Customize Your Keyboard!

Lets you enter several software commands or a word or paragraph with one keystroke!

ONLY $19.95

SMART KEY Keyboard Macro Utility

For IBM PC's and Compatibles

Made by **Software Research Technologies**

~~Mfr. Retail $69.95~~

SOFTWARE

SmartKey *Version 4.1*

Lets you enter several software commands or a word or paragraph with one keystroke!

- Saves You Time and Effort by Eliminating Repetitive Keystrokes
- Turn Up to 30,000 Keystrokes Into 1 Keystroke
- Customize any Software Package by Creating Your Own Macro Definitions
- Predefined Macros for **Lotus 1-2-3, WordStar** and **dBase**
- Customize Your Keyboard—Move Any Key to a Different Location
- Extremely Easy to Use
- Works With Any IBM PC or Compatible Computer

plus SmartPrint Printer Utility *Version 4.1*

Lets You Create Specialized Print Modes With One Keystroke!

Wide Print **Emphasized** Condensed

Superscripts Subscripts Underlines

Italic

- *Works With Any Epson Compatible Printer*

"Can you imagine a computer without SmartKey? I can't and I have a vivid imagination."
—**William F. Buckley**

"A must for every computer."
—**Peter McWilliams, *The Word Processing Book***

Also Available...

SmartPath PLUS SmartDisk

ONLY $19.95

Both Programs on One Disk!

SmartPath *Version 1.1F*

Makes Your Hard Disk Work Better & Faster!

Allows you to load and program from any directory on your hard disk, including programs with overlay files. No more multiple copies of programs on your hard drive. Prevents software like Lotus 1-2-3, WordStar and dBase II & III from crashing—no more "Overlay Not Found" errors. It can save up to 20% of your hard disk space.

PLUS

SmartDisk *Version 1.2 AD*

Lets Your IBM PC or Compatible Read, Write and Format CP/M Disks!

- Supports **219** CP/M Disk Formats, including Kaypro, Osborne, Altos, Epson QX10 and Many Others
- Reads and Writes MS-DOS Format Disks Which Cannot Be Read Directly Under PC-DOS

100% Satisfaction Guaranteed!

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Limited manufacturer's warranty plus 15 day trial. If you are not completely satisfied with this software for any reason, simply call to return it within 15 days of receipt for a complete refund.

Ordering Information

Product #	Item	Price	Ship./Hand.
SK41-C4	SmartKey plus SmartPrint	$19.95	$5
SD241-C4	SmartPath plus SmartDisk	$19.95	$5

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Lowest Prices Anywhere!

Leading Edge® Word Processor

For IBM and All Compatible Systems

ONLY $29

Basic & Simple Version Mfr. Retail ~~$100.00~~ **$29**

With Spelling Checker and Merge/Print Options Mfr. Retail ~~$250.00~~ **$39**

- 80,000 Word Spelling Dictionary (Included with Spell & Merge Version)
- Adds or deletes characters
- Recalls deleted characters if you change your mind
- Automatically backs up your programs, even if you forget
- Makes two backup copies, not just one
- Splits screens for access to two documents at once
- Prints up to seven colors with compatible printers, including IBM, Epson, Diablo, C.Itoh, NEC, Qume, Star Micronics
- Underlines important words and phrases on screen
- Toll free support line plus on-line help
- Marks ends of pages where you want them
- Prints boldface, double wide, italics, underscores, superscripts, and subscripts
- Comes complete with training disk and reference manual
- Sets and resets margins and tabs
- Moves blocks of type
- Cut and paste capabilities
- Merges paragraphs
- Merge/Print supports dBase II files
- Centers words, lines and columns
- Text and Keystroke Macros
- Change between upper and lower case characters
- Time and date commands

"The Leading Edge Word Processor offers the best balance of user friendliness, performance and features of all the programs tested."

— Software Digest, January 1986

Software Digest is an independent publication which accepts no advertising. Other programs tested included WordPerfect, Volkswriter Deluxe, WordStar 2000 Plus and Microsoft World.

"This program is a gem, and at $250, it's also a gem of a bargain!"

—PC Magazine, January 28, 1986

SOFTWARE

Ordering Information

Product #	Item	Price	Ship./Hand.
LE999-C4	Leading Edge Word Processor—Basic & Simple Version	$29	$5
LE888-C4	Leading Edge Word Processor w/Spell & Merge Options	$39	$5

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Lowest Prices Anywhere!

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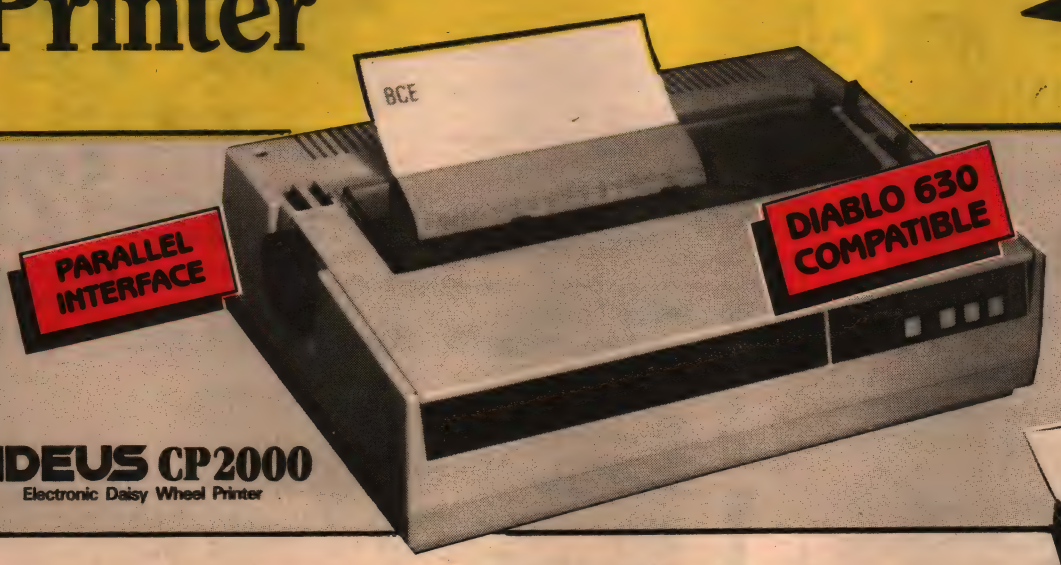
Liquidation! 22 CPS Letter Quality Printer

70% OFF LIST



ADEUS CP2000
Electronic Daisy Wheel Printer

~~Mfr. Retail $499.00~~

ONLY $149
Lowest Price Anywhere!

LETTER QUALITY PRINTERS

- 22 CPS Bi-Directional Printing
- Uses Diablo/Qume Printwheels
- Uses Diablo/HyType II Ribbons
- 2K Buffer
- Parallel Interface
- 90 Day Manufacturer's Warranty

Sheetfeeders
ONLY $99

100% Satisfaction Guarantee

90 day manufacturer's warranty plus 15 day trial. If you are not satisfied with this printer for any reason, simply call within 15 days of receipt to return it for a complete refund.

Ordering Information

Product #	Item	Price	Ship./Hand.
AD20P-C4	Adeus CP2000 Printer—Parallel	$149	$19
AD420-C4	Adeus CP2000 Sheetfeeder	$99	$7
CA200-C4	IBM Parallel Cable	$19	FREE SHIPPING WITH PRINTER ORDER
CA250-C4	Centronics to Centronics Parallel Cable	$19	

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Specifications:

Print Speed: 22 CPS, 20 CPS Shannon Text
Daisywheel: 96 characters, Diablo/Qume compatible
Ink Ribbon: Cartridge type, Diablo HyType II compatible
Printing Pitch: 10, 12, 15 CPI and proportional spacing
Characters per Line: 110 CPL—10 pitch, 132 CPL—12 pitch, 165 CPL—15 pitch
Paper Width: 13½″
Maximum Printing Width: 11 inches
Compatibility: Diablo 630 (standard)
Buffer Memory: 2K
Carriage Movement: 1/120 inch minimum, bidirectional
Paper Feed: 1/48 inch minimum vertical spacing using friction feed
Copy Capacity: 1 original plus 3 copies
Power Rating: 110, 115, 220 or 240 VAC, 50/60 Hz
Interface: Centronics parallel
Noise Level: Less than 50 dB
Dimensions: 18.7″(W) x 5.5″(H) x 13.0″(D)
Weight: 15.4 lbs.

VISA MasterCard CHOICE

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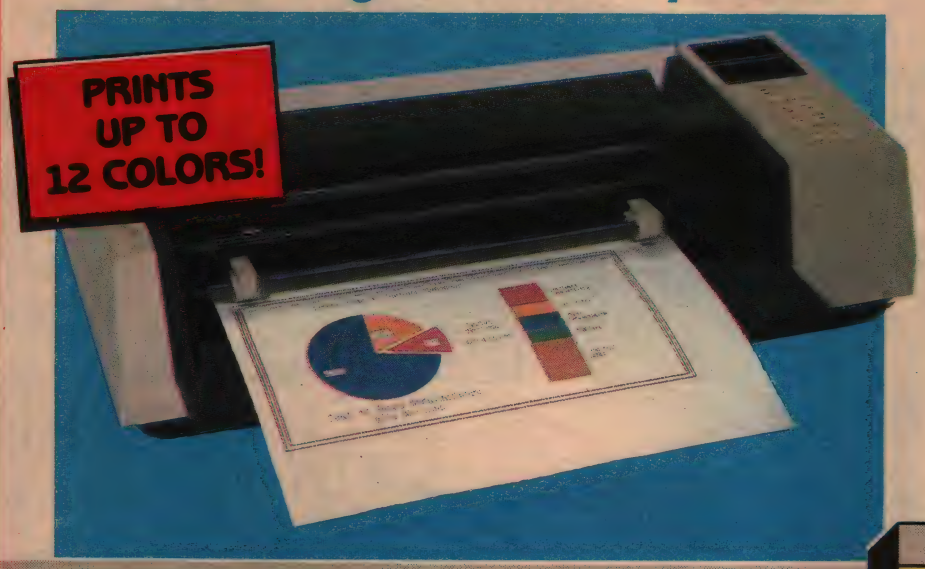
Plotter Liquidation!

Completely HP Compatible!



ONLY $299

Model 4550
Regular Bed Plotter
ONLY $299
~~Mfr. Retail $795.00~~

Model 4551
Wide Bed Plotter
ONLY $599
~~Mfr. Retail $995.00~~

FACIT 4550/4551 Plotters

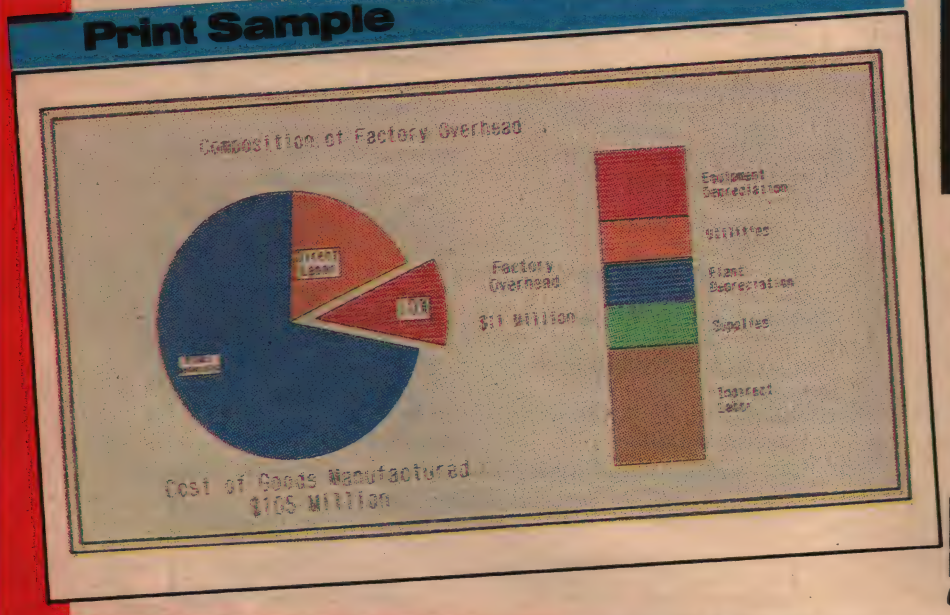
Wide Bed and Regular Bed Models Available

- Hewlett Packard Graphic Language (HP-GL) Emulation
- Use for Business Graphics or CAD/CAE Drawings
- Roller Bed Technology
- Prints In 12 Colors (6 Pens Per Cassette)
- Small Footprint
- Prints on Paper or Overhead Film
- 3D Capability
- 6 Pen Cassette
- Parallel and Serial Interfaces Standard

Specifications

	Facit 4550	Facit 4551
Media Sizes	A4 (ANSI A) 8½" x 11"	A3 (ANSI B) 11" x 17"
Plotting System	Moving Paper/Moving Penhead	
Pen Types	Ballpoint, 0.4mm	
Number of Pens	6 per Cassette	
Colors	8 to 12	
Pen Velocity	Paper: 150mm/sec	Paper: 200mm/sec
	Overhead Film: 60 or 100 mm/sec	
Resolution	0.1 mm	
Repeatability	0.2 mm	
Accuracy	±0.3% ±0.2 mm	
Graphic Commands	HP Graphic Language—HP 7470, HP 7475	
Alpha Commands	HP Graphic Language in 16 National Versions	
Character Speed	Alphanumeric Characters: approx. 4.5 CPS Character Resolution 32 x 32	
Input Buffer	2K	
Interfaces	Parallel (Centronics) and Serial (RS-232)	
Protocols	READY-BUSY, XON-XOFF, ETX (ENQ)-ACK	
Power	100/115 V or 220/240 V	
Dimensions L x W x H	440 x 285 x 132 mm 17 x 11 x 5 inches	525 x 285 x 132 mm 20.5 x 11 x 5 inches
Weight	6.0 kg 13.3 lb	6.85 kg 15.2 lb

Print Sample



100% Satisfaction Guarantee

90 day manufacturer's warranty plus 15 day trial. If you are not satisfied with this plotter for any reason, simply call to return it within 15 days of receipt for a complete refund.

Ordering Information

Product #	Item	Price	Ship./Hand.
FA550-C4	Facit 4550 Regular Bed Plotter	$299	$15
FA551-C4	Fact 4551 Wide Bed Plotter	$599	$17

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PLOTTERS

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We ship anywhere in the continental US by UPS ground. Please allow three weeks shipping time. Quantities of all items are limited, prices subject to change without notice. We accept major credit cards, company and personal checks, and money orders. We accept purchase orders from schools, churches and Fortune 1000 companies. Sorry, no C.O.D. orders. **All returns must have prior authorization** from our Customer Service department (1-800-231-3549). All returns must be in like-new condition and in original packaging. Unauthorized returns and refused shipments are subject to a 20% restocking charge.

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7 Color Graphics Printer

with Free Software!

Mfr. Retail ~~$599.00~~

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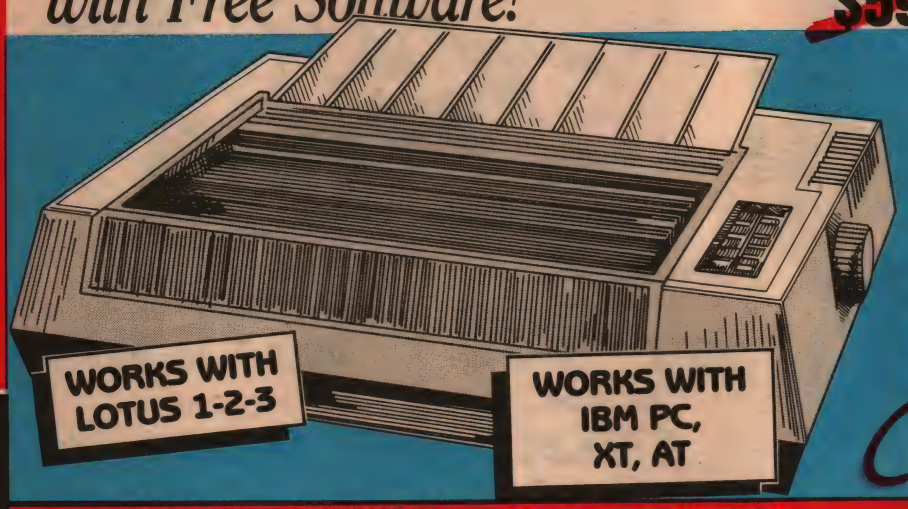
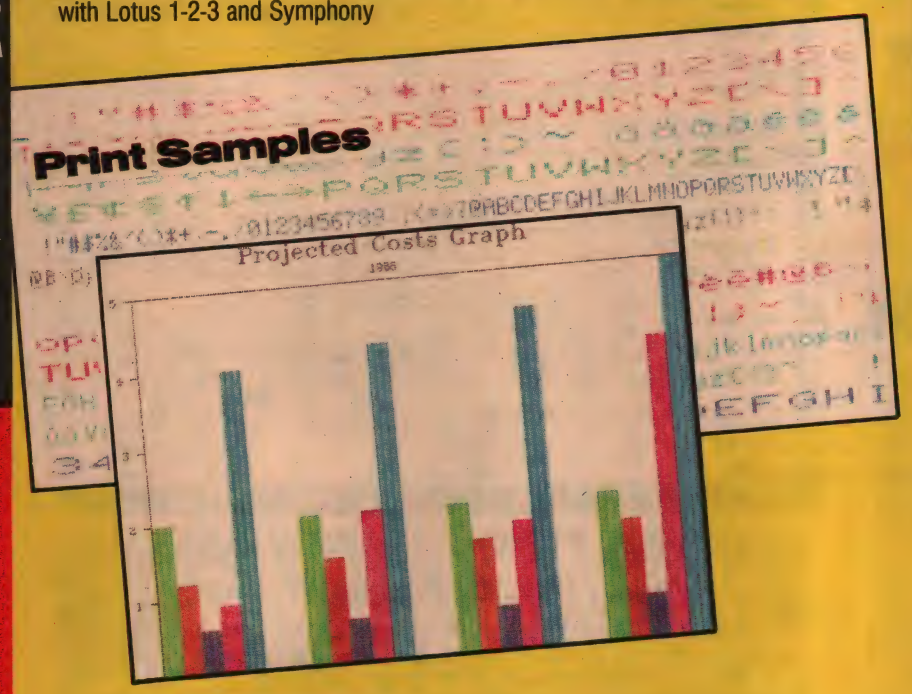


ONLY $159

Made by SEIKOSHA — Same as GP7000

- Prints in Red, Yellow, Green, Purple, Cyan, Magenta, Black and Many Combinations and Shades!
- Centronics Parallel Interface
- Works Directly with Lotus 1-2-3 and Symphony

COLOR COMPUTER



Ordering Information

Product #	Item	Price	Ship./Hand.
GP700-C4	7 Color Graphics Printer	$159	$15
CA200-C4	IBM Parallel Cable	$19	FREE SHIPPING WITH PRINTER ORDER
CA250-C4	Centronics to Centronics Parallel Cable	$19	

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Pizazz™ FREE State of the Art SOFTWARE!

For IBM PC's and Compatibles

Lets You Print Whatever's On Your Screen— Version Designed Especially for this Printer

- RAM Resident—Call Up within Your Application Program
- Works with Most Application Programs, including Lotus 1-2-3
- On-Screen Menu Lets You Rotate, Enlarge and Reduce Images, Print Only a Portion of the Screen and Smooth Out Jagged Edges
- Supports 13 Graphics Boards Including EGA

Specifications

Printing Method: Impact type dot matrix (Seikosha's unique 4-hammer method)
Printing Direction: Undirectional (left to right)
Printing colors: Black, cyan, purple, magenta, red, yellow, green (colors can be specified down to the individual dot level)
Character Composition:
5x8 (horizontal x vertical) + 1 dot space
7x8 (horizontal x vertical) + 1 dot space
Character Types: Alphanumeric English character set and symbols
Character Size:
2.2mm x 2.5mm (horizontal x vertical) 10.0 cpi
1.6mm x 2.5mm (horizontal x vertical) 13.3 cpi
Character Spacing: 10 characters/inch and 13.3 characters/inch
Printing Speed: 38 characters/sec and 50 characters/sec
Line Spacing: 1/6, 1/8, and N/120 of an inch (software selectable)
Multiple Copies: Original plus 2 copies (35 kg paper) (color is only on the original)
Graphics: Arbitrary combinations of any color of dot in an 8-dot column with up to 640 columns/line. Intermixing text and graphics on the same line is allowed.
Paper Feed Direction: Forward direction only
Minimum Linefeed Amount: 1/120 of an inch
Linefeed Speed:
10 lines/sec (1/6" continuous linefeeds)
15 lines/sec (1/10"continuous linefeeds)
Paper Insertion: From above at the back
Paper Feed Method: Both pin feed and friction feed are used together
Ink Ribbon: Special cassette type
Ink Color: Black, cyan, magenta, yellow 4-color ribbon
Power Supply: 120 VAC ± 50/60 Hz
Power Consumption:
30 watts (continuous printing of text)
13 watts (standby)
Dimensions: 450mm (W) x 113mm (H) x 320mm (D)
Weights: 6 kg

100% Satisfaction Guarantee
90 day warranty from BCE plus 15 day 100% satisfaction money back guarantee. If you are not satisfied with this printer for any reason, simply call within 15 days of receipt to return it for a complete refund.

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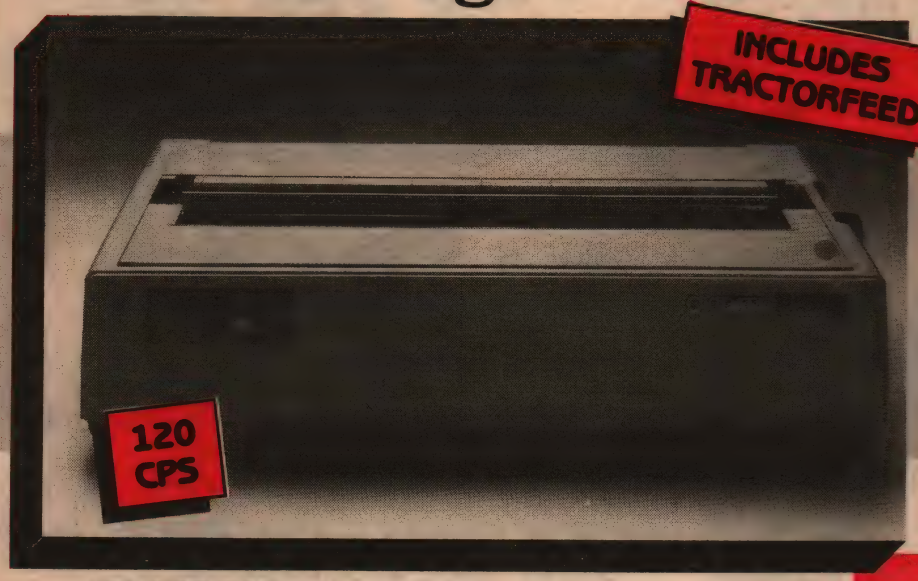
OKIDATA ML83A
Wide Carriage Printer



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~~Mfr. Retail $749.00~~

Liquidation Price $199

- 120 CPS Bidirectional Printing
- Tractorfeed or Friction Feed
- Heavy Duty Steel Construction
- Centronics Parallel Interface

Features

- 136 Columns with Standard Characters
- 224 Columns with Condensed Characters
- ASCII 96-Character Set (Complete IBM Character Set with IBM Plug 'N' Play PROM—Optional)
- Upper and Lower Case Characters with True Descenders
- Double Width Characters
- 64 Block Graphics Shapes (IBM Graphics Capabilities with IBM Plug 'N' Play PROM—Optional)
- Long-life 9-Pin Printhead
- Short Line Logic Seeking
- 6 and 8 Lines Per Inch Vertical Spacing
- 12-Channel Electronic VFU (Vertical Format Unit) for Extensive Forms Control
- Friction and Tractorfeed
- Centronics Parallel Interface
- 90 Day Warranty—*1 Year Warranty on Printhead*

Specifications

Print Speed: 120 cps, bidirectional, short line seeking
Print Method: Dot matrix impact
Line fee speed: 6 lpi, 115 ms; 8 lpi, 95 ms
Interface: Parallel Centronics
Character Matrix: 9 x 9
Characters per Line: 136 characters @ 10 cpi; 224 characters @ 16.5 cpi; 66 characters @ 5 cpi; 112 characters @ 8.3 cpi
Graphics: 64 block shapes
Paper—number of parts: 4 (original plus 3 copies)
Maximum width of paper: Friction feed—15″, Tractorfeed—16″
Pin to Pin Measurements (Tractorfeed): 2″ to 15.5″
Paper Path: Rear/bottom
Ribbon: Spool type, Okidata or approved substitute
Format Controls: Vertical format, Top of form, Vertical Tab
MTBF: 4000 Hours
Voltage: 115 or 220/240 VAC ± 10%
Frequency: 50 or 60 Hz
Power: 90 watts
Size: 20.1″(W) x 12.9″(D) x 5.2″(H)
Weight: 30.9 lbs.

Ordering Information

Product #	Item	Price	Ship./Hand.
OK83A-C4	Okidata ML83A Printer	$199	$22
OI34I-C4	IBM Plug 'N' Play PROM	$19	FREE SHIPPING WITH PRINTER ORDER
CA200-C4	IBM Parallel Cable	$19	
CA250-C4	Centronics to Centronics Parallel Cable	$19	

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IBM Plug 'N' Play PROM $19

Enables Complete IBM Text and Graphics Character Sets—Installs in Minutes!

(Available only with purchase of printer.)

100% Satisfaction Guarantee

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DP ORTINTMATRS IRSIX

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EPSON 420 cps/NLQ Wide Carriage Printer

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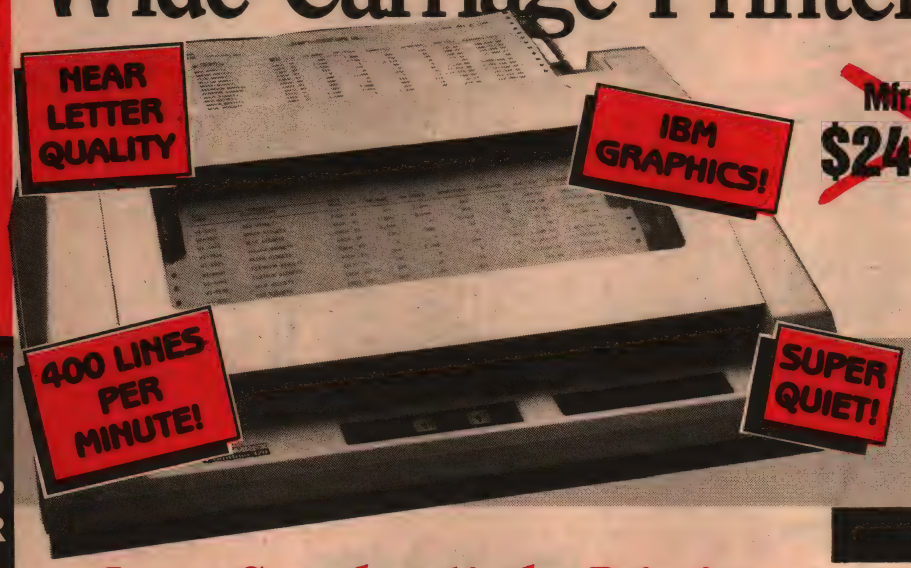

~~Mfr. Retail $2495.00~~

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DOT MATRIX PRINTERS

EPSON COMREX CR420
Same as Epson 420i

Laser Speed at ¼ the Price!

- 417 CPS Draft, 104 CPS NLQ
- Complete IBM Text and Graphics Character Sets
- 9 Type Styles Selectable from Front Panel
- Built-In Tractorfeed—Rear and Bottom Feed
- Parallel *and* Serial Interfaces
- 18K Buffer
- Built-In Acoustic Cover
- Heavy Duty Construction

Specifications

Print Method: Impact Dot Matrix **Print Direction:** Bidirectional Logic Seeking **Print Speed:** 417 cps Standard 10, 12, 16 Pitch, 208 cps Boldface & Super/Subscript, 104 cps Near Letter Quality **Number of pins:** 8 (Staggered Arrangement) **Character Set:** IBM PC Compatible, Low & High Order Character Set **Character Styles:** Draft—10, 12, 16, and 20 Pitch Near Letter Quality—10, 12, and Proportional Pitch **Character Attributes:** Boldface, Italicized, Expanded, Super/Subscripted, Underlined **Interfaces:** Parallel Centronics and Serial RS-232C **Baud Rate:** 1200, 2400, 4800, 9600 **18K Input Buffer:** Standard **Indicators:** Power On, Paper Out, On-line **Switches:** Power On/Off, On-Line, Top of Form Set, Form Feed, Line Feed Reset **Detectors:** Paper Out and Error Detection Alarm **Print Head Life Expectancy:** 200 Million Characters **MTBF (Excluding Print Head; Life):** 3200 Hours at 25% Duty Cycle & 30% Page Density **Ribbon Type:** Cartridge **Ribbon Life Expectancy:** 10 Million Characters, Draft, 78 Million Characters, Correspondence **Power Consumption:** 175 Average Watts (Printing), 55 Watts (Standby) **Paper Feed:** Friction and Pin Feed **Form Width:** 4⅞"–15½" **Copies:** Original plus Four (maximum thickness 0.0118", carbonless) **Paper Path:** Rear and Bottom **Dimensions:** 23.4"(W) x 7.6"(H) x 15.9"(D) **Weight:** 60 lb. **Front Panel Selection of:** Nine Fonts, Nine Forms Lengths **Acoustal Noise:** 60db(A) **Standard Accessories:** Cassette Style Ribbon, Single Color; Paper Rack, User's Guide

100% Satisfaction Guarantee

90 day factory warranty from EPSON plus 15 day trial. If you are not satisfied with this printer for any reason, simply call to return it within 15 days of receipt for a complete refund.

Print Samples

Draft
abcdefghijklmnopqrs
ABCDEFGHIJKLMNOPQR
1234567890-=[];'

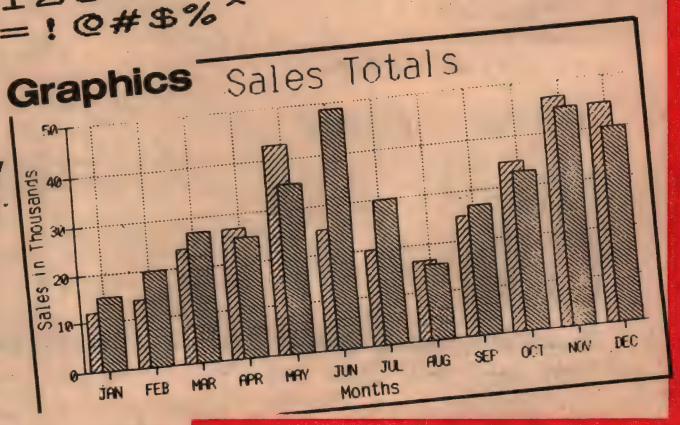
Condensed
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
1234567890-=!@#$%^&*()_+{}

Near Letter Quality
abcdefghijklmnopqrst
ABCDEFGHIJKLMNOPQRS
1234567890-=!@#$%

Enlarged
abcdefghi
ABCDEFGH
1234567
=!@#$%^

Italics
abcdefghijklmnc
ABCDEFGHIJKLM
1234567890-

Graphics



Ordering Information

Product #	Item	Price	Ship./Hand.
C420-C4	Epson/Comrex 420 Printer	$629	$29
CA200-C4	IBM Parallel Cable	$19	FREE SHIPPING WITH PRINTER ORDER
CA250-C4	Centronics to Centronics Parallel Cable	$19	

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Monday - Friday, 9 AM–8 PM Eastern

Product Information
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FOR IBM PC, XT, AT

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LOAD, UNLOAD or SWITCH RAM Resident Programs without Rebooting

Comparable Price ~~$69.95~~

RAM Resident Management Utility

By POPULAR PROGRAMS, INC.

For IBM PC's and Compatibles

PopDrop lets you load, unload or switch between RAM resident programs, RAM disks or print spoolers at the touch of a button.

End Fatal Errors

No longer do you have to re-boot your system and lose valuable data when you get fatal errors caused by interaction of RAM resident programs, such as *SideKick* or *Superkey*, *SmartKey* or *PopUp DeskSet*, with some application programs or other RAM resident programs.

PopUp lets you remove RAM resident programs from memory at the touch of a key, avoiding these compatibility problems.

Free Up RAM

It also lets you free up valuable RAM for other applications; for example, if you need more RAM to run a spreadsheet program.

PopDrop lets you reactivate the RAM resident programs at the touch of a button.

Switch Between RAM Resident Programs

PopDrop also lets you switch automatically between different RAM resident programs. For example, if you want to use one set of RAM resident programs while using your word processor, and a different set while in your spreadsheet, **PopDrop** can switch between the two sets automatically.

PopDrop displays on screen the number of RAM resident programs currently loaded, how many bytes are being used by each one, and the total number of free bytes available in RAM.

PopDrop comes with complete documentation and is not copy protected for use with hard disk systems.

FOR IBM AT

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High Density Floppy Disks

1.2 MB Capacity

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Lifetime Warranty!

- 1.6 MB Unformatted Capacity
- 1.2 MB Unformatted Capacity
- 5¼" Double Sided Double Density
- Sleeves and Labels Included
- Bulk Packed—100 Per Box, 10 Bags of 10
- 256 Bytes per Sector
- 26 Sectors per Track
- 160 Tracks per Disk (80 Tracks Each Side)

SOFTWARE FLOPPY DISKS

100% Satisfaction Guarantee

All products come with complete manufacturer's warranty plus our 15 day 100% satisfaction guarantee. If you are not satisfied with any product for any reason, simply call within 15 days of receipt to return it for a complete refund.

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PU735-C4	PopUp PopDrop	$19.95	$5
FJ122-C4	100 Fuji High Density Floppy Disks	$149	$7

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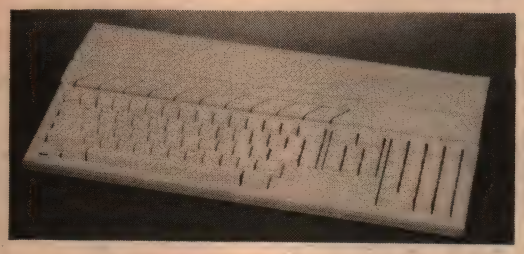
HOME COMPUTERS.

Atari Computers

520ST Monochrome System.....$499.00
520ST Color System.....749.00
1040ST Color System.....879.00
800XL 64K Computer.....63.99
65XE 64K Computer.....97.99
130XE 132K Computer.....129.00

Atari Peripherals

1020 Color Printer.....29.99
1050 Disk Drive.....129.00
835 300 Baud Modem.....24.99
850 Atari Interface.....109.00
M301 300 Baud Modem.....39.99
XM801 80-Column Printer.....199.00
XM804 ST Printer.....189.00
ICD PR Connection.....59.99
Xetec Graphix (XL, XE).....39.99



Atari 1040 Color System $879

Includes: 1040ST, 1 mb RAM with 3½" drive built-in, 192K ROM with TOS, Basic, Logo, ST language, power supply and color monitor.

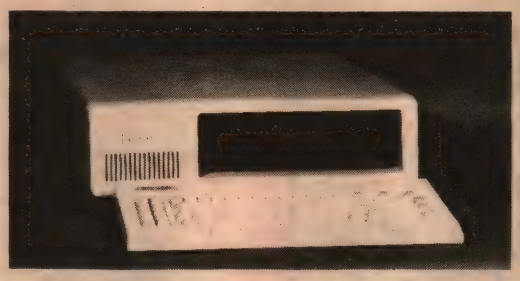
Commodore Computers

Commodore-64C 64K Computer189.00
Commodore-64C System w/1802C539.00
Commodore-128 128K Computer259.00
Commodore-128 System.....759.00
Amiga 500 & 2000.....call

Commodore Peripherals

1660 Commodore Modem.....59.99
1670 Commodore Modem.....99.99
1541C Disk Drive.....189.00
1571 Disk Drive.....239.00
1802 Color Monitor.....199.00
1902 Color Monitor.....299.00
Amiga 1010 3½" Ext. Drive.....219.00
Amiga 1020 5¼" Ext. Drive.....189.00
Amiga 1080 RGB Monitor.....269.00
C128 512K Expansion Board.....179.00
PPI Parallel Printer Interface.....34.99
Xetec S/Graphix 8K.....69.99
Micro R&D MW350.....44.99

MS/DOS SYSTEMS.



PC-TOO 20 Meg XT-Compatible $999

AT&T 6300.....from $1299.00
Compaq.....from 1699.00
Cordata.....from 899.00
IBM-XT.....from 1099.00
IBM-AT.....from 2699.00
Leading Edge.....from 999.00
NEC Multispeed.....from 1499.00
Panasonic Business Partnerfrom 799.00
Toshiba 1100 Plus.....from 1749.00

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Six Pak Premium PC/XT.....249.00
Advantage-AT 128K.....339.00

Everex

EV-221 Evergraphics Mono.....139.00
EV-640 Edge Card.....259.00

Hercules

Color Card.....159.00
Graphics Card Plus.....209.00

Fifth Generation

Logical Connection 256K.....329.00

IDEAssociates

IDE-5251 Local Emulator.....579.00

Intel

1110 PC Above Board.....279.00
Inboard 386K 0K.....Call

NEC

GB-1 EGA.....409.00

Quadram

Quad Ega+ Graphics Adapter....299.00
Silver Quadboard.....129.00
Expanded Quadboard.....119.00

VIDEO 7

EGA Video Deluxe.....389.00

Zuckerboard

Color Card w/Parallel.....89.99
Monochrome Card w/Parallel.....99.99
576K Memory Card.....59.99

DRIVES.

Allied Technology

Apple Half-Heights.....$109.00
Controller Card.....39.99

CMS

Drive Plus 20MB Internal Card....399.00

Everex

Stream 20 20MB Tape-Backup....669.00

Genie Technology

210 H 10+10 subsystem.....1749.00

Indus

Atari GT Disk Drive.....189.00
Commodore GT Disk Drive.....189.00

Iomega

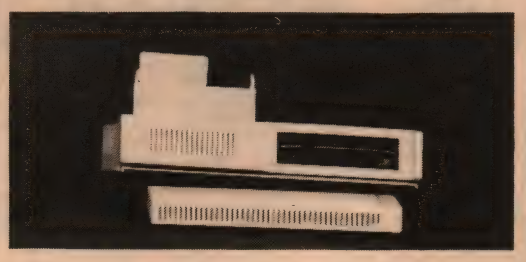
A210H 10+10 Bernoulli Box.....1899.00
A220H 20+20 Bernoulli Box.....2499.00

Irwin

110 D 10MB Tape backup.....319.00

Mountain Computer

Drive Card 20MB Internal Card...499.00
A220 20+20 Subsystem.....2199.00



Racore Jr. Expansion Chassis $299

Seagate

ST-225 w/Controller.....399.00

Toshiba

Half-Height 360K internal.....89.99

DISKETTES.

Maxell

MD-1 SS/DD 5¼".....$8.99
MD-2 DS/DD 5¼".....10.99
MD-2HD Hi-Density 5¼".....21.99
MF-1 SS/DD 3½".....12.99
MF-2 DS/DD 3½".....21.49
CS-500 20Mb Streamer Tape.....11.99
CS-600 60Mb Streamer Tape.....13.49

Sony

MD1 SS/DD 5¼".....7.99
MD2 DS/DD 5¼".....9.49
MD-2HD Hi-Density 5¼".....20.49
MFD-1 SS/DD 3½".....12.99
MFD-2 DS/DD 3½".....19.99

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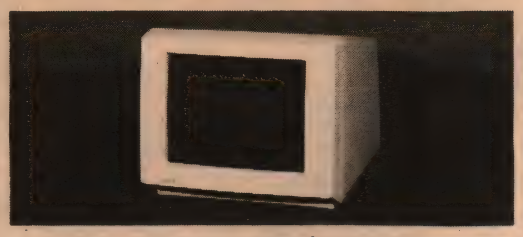

Amdek 410 12" TTL Monitor $159

Amdek
Video 310A Amber TTL.....$149.00
Color 722 RGB, CGA/EGA.....479.00
Magnavox
8CM515 RGB Monitor-80.....289.00
7BM623 PC Monitor-80 Amber....99.99
8CM873 14" Multimode.....549.00
Mitsubishi
XC 1409C 14" RGB.....319.00
NEC
12" TTL Green or Amber.....109.00
JC-1401P3A Multi-Sync.....579.00
Princeton Graphics
MAX-12 12" Amber TTL.....169.00
HX-12 12" Color RGB.....429.00
HX-12E 12"RGB/EGA.....499.00
Quadram
8460 Quadchrome Enhanced....439.00
Taxan
Model 124 12" Amber.....119.00

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6480 C64/128 1200 Baud.....$119.00
Omega 80 Amiga.....129.00
VM520 ST520/1040 1200 Baud...139.00
Expressi PC-1200 Half Card.....149.00
Everex
Evercom 1200 Baud Internal.....119.00
Hayes
Smartmodem 300 External.....139.00
Smartmodem 1200B Internal.....359.00
Smartmodem 2400B Internal.....539.00
Practical Peripherals
Practical Modem PC-1200.....139.00
Quadram
Quadmodem II 1200 Baud.....299.00
Supra
MPP-1064 AD/AA C64.....69.99
1200AT 1200 Baud Atari.....149.00
U.S. Robotics
2400 Baud Internal.....189.00

PRINTERS.

Canon
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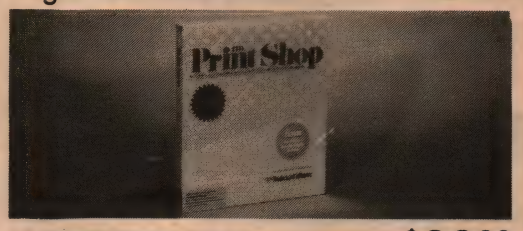

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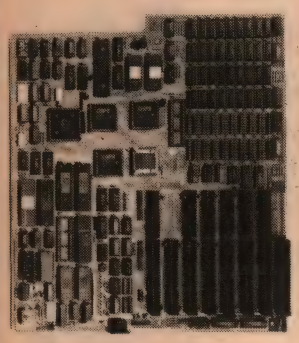

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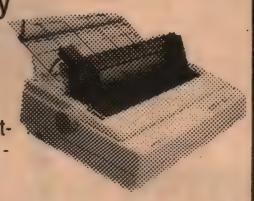

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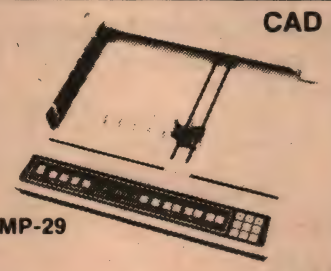

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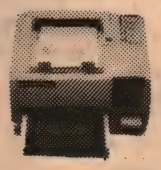

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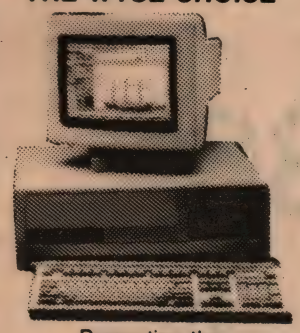

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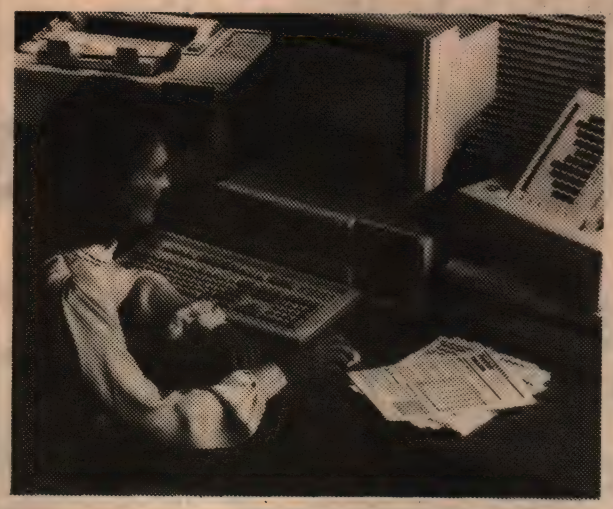

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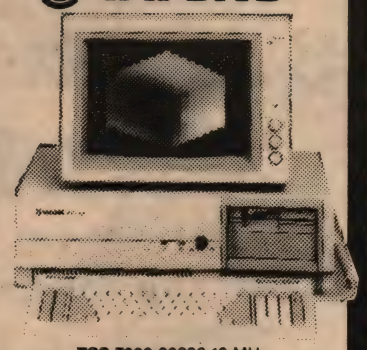

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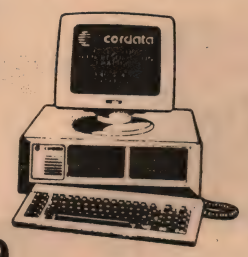

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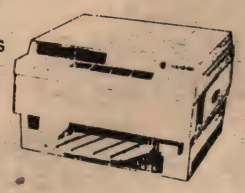

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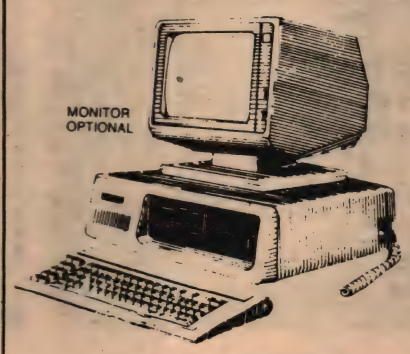

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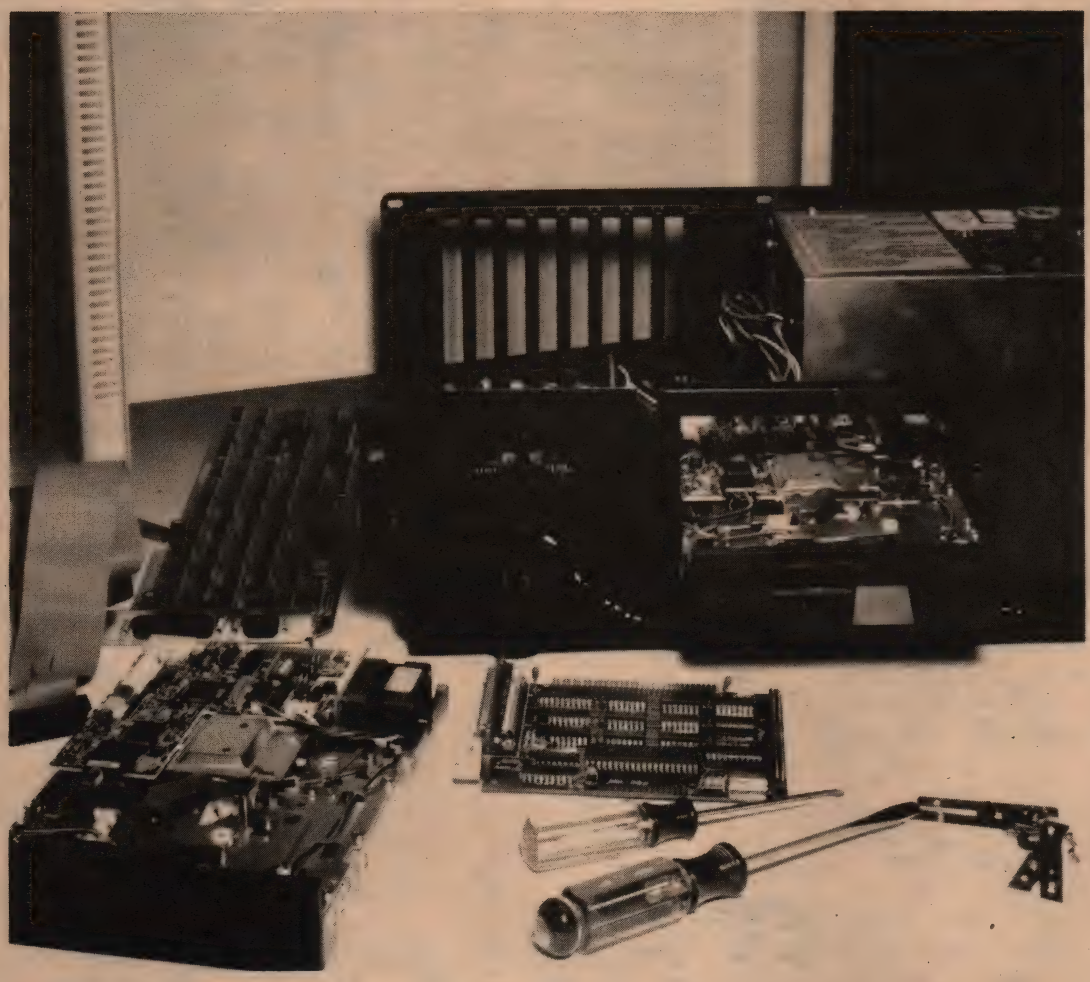

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User-Supported and Public Domain Software are available through a carefully selected library of quality software programs. For the new user Public Domain Software is not only a way to save money but also a way to learn new skills! And for the more advanced user P.D. Software offers existing routines that can be modified to your taste rather than writing a new one from scratch. Experienced users will find improving or adopting programs to use on different types of computers challenging and enjoyable.

PROGRAMS ON DISK

18 PC-TALK (Communications Package), Pacman 2, PC Notes
19 PC-FILE (Database Package)
20 Remote Bulletin Board System, Miscellaneous Utilities
21 Cross-reference Utility, Front-End Interface Utility (Monitor)
22 Expanding the Lister Utility for BASIC Programs
23 RATBAS, Warm System Restarts, Strip-Off Word* High Bits, Graphtrax Utilities
24 BASIC Games
25 BASIC Games
26 8087 Sampler Programs
27 KERMIT- PC/Mainframe Host Communications by Columbia Univ. (1 of 2)
28 KERMIT - PC/Mainframe Host Communications by Columbia Univ. (2 of 2)
29 Miscellaneous BASIC Programs
30 Misc. Appl. Sys: Cryptography, filing, Inventory, Mail List, Regression
31 PC-TALK III (Supercedes PC-TALK in volume 18)
32 PC-TALK III (Documentation, Miscellaneous Communication Systems
33 Misc. Applications: Compression Music, Dates, Sunrise, Plotting, etc.
34 dBASE and SuperCalc(tm) Templates
35 Miscellaneous Basic Utilities
36 IBM Keyboard Drill System
37 MODEM7 for IBM PC, Program Control System, WordStar Mods, Misc. Util.
38 Disk Directory Util., Squish REMarks, Lotus 1-2-3 Mods
39 Screen Editor, Primitive Word Proc. Memo Minder, History and Mult. Drills
40 EPISTAT Statistical Package, IBM MODEM Programs
41 Galaxy Trek with Graphics (Also works with Monocchrome)
42 A Cheap Assembler, Electronic RAM Disk, Misc. Utilities
43 Inventory Order Control System in dBASE II
44 PC Graphics by Eugene Ying
45 Bulletin Board System
46 Ringy Dingy Asynch. Communications Program, PC-FILE III
47 Software Encipherment, Misc. Util (Extracted from Capital PC)
48 Portfolio Evaluation System, Graphic Draw, Hi-Res Screen Print, Print Spooler
49 Remote Bulletin Board System: RBBS - CPC Ver 12.1
50 FreeCalc-Spreadsheet Program
51 Tax456-Lotus 1-2-3 Template for 1983 Income Taxes
52 New Key; Miscellaneous Utilities and Games by Vincent Bly
53 PC-Dial (Communications), PC-Write (Word Proc.), PC-Compare (File Mgt.)
54 FIG-FORTH (Vol. 1 of 2)
55 FIG-FORTH (Vol 2 of 2)
56 Utility 1-2-3 Utilities for Lotus 1-2-3
57 Ultra Utilities, Squeeze/Unsqueeze Library Update System, Disk Utility
58 Geneological System
59 EPISTAT Ver. 3.0, Statistical Package PC-Compare
60 Ten-Key (limited version), Media Magician (limited version), PC-Musician
61 Miscellaneous Basic Games
62 WITHDRAWN by author
63 Lotus Templates, Programmers Calculator, Touch Typing Practice, Print Spooler
64 Home Finance Program, Full Screen Editor, BASIC Program Optimizer, DOS 2 Utilities
65 Micro Accounting System, Mailsen Programs, Task Planning Program, Mail List System, Calendar Reminder
66 Miscellaneous Utilities
67 File Manager - Updated from Volume 30, Finance Manager, COMFAX Justify Program
68 DOS Menu Master, 8086/8087/8088 Disassembler, Miscellaneous System Utilities
69 Virtual Teaching Language Interpreter
70 Disk File Catalog Program-
71 Encipherment System Ver 1.53, PC-DOS Version
72 Super Encipherment, MS-DOS Ver 1.52
73 Tips, Notes, & Techniques for the IBM-PC
75 Property Management (dBase II Ver 2.4 required)
76 Updated Communications System Kermit
77 One RD Modem Communications
78 PC Write VS 2.4
79 RAM-drive quadram Memory
80 Multi-function Util., Experimental Lisp. Fog Finder, ID & execute
81 Library Update, Poor Man's Mouse, "Talking" PC, PC-DOS Help, Util.
82 8083 FORTH Ver 2.1
83 Finance Manager, Personal Date Book
84 Lotus Power Worksheets
85 Gludraw-line Graphics System
86 Roff (MS-DOS) Test Editor Ver 1.6 Extended Batch Language Ver 2.0
87 Listmate, PC-Check
88 Family Tree, Letters n' Labels, Banner Generator
89 Disk Copy, Small Sprdsht, Global Pathing, DIR Commands, TOS Printer
90 Supertrek, Ver 1 of 3 FORTRAN Source Code 8087 Needed
91 Supertrek, Ver 2 of 3 FORTRAN Source Code 8087 Needed
92 Supertrek, Ver 3 of 3 FORTRAN Source Code 8087 Needed
93 IBM PC User's Group Newsletter 11/84
94 PC-DOS 2 Help, dBase II Mail-list, comXmod, Sys Clock Reminder
95 Word Processor for Kids, Checkbook/Ledger Util. File Listing
96 Fido Bulletin Board System, Ver 10.0 Ver 1 of 2
97 Fido Bulletin Board System, Ver 10.0 Ver 2 of 2
100 U.S. Census Utility Ver 1 of 2
101 U.S. Census Utility Ver 2 of 2
102 Games, 3D Demon Chs, Catch Baby, Castle Adventure, Janitor Joe
103 Pascal Games, Third Dimension 3D Graphics Generator
104 Misc. Util.: Window Pop-up, Disk Patch, Hex Conv., WordStar ASC Refmt
105 Misc. Util.: Unix Term Emul, Com Library Ptdt, dBase II/III mnu
106 Modem Programs: PC-TALK III Ver 5, PC-TALK for Jr., IBModem for Jr.
107 Modem Programs: Kermit Ver 2.26, Qmodem Ver 2.87e
108 XDir, dBase Phone Util., Time Keeper Ver 1.4, Exended Batch Lang
109 Part 1 of 2
110 Multi-User RBBS Ver 12.3b Incl Source Capital PCug)
111 MS-DOS + Turbo Helps, ASCII to Lotus, Epson MX80, Stack Commands, Hebrew
112 LU Unfolds .LBR, UnSQueeze, dBase + BasicA Menu Maker, Def Func Key, Amortze
113 Time and money Ver 1.1: A Simple Financial Monitor
114 PC-Talk III .EXE and DOC, QModem for 103A, Daily Diary
115 ScreenWrite Formatting Program, PC/Calculator
116 dBase Genealogy, db Church Mgmt, db Checkbook Mgr (need LU)
117 Genealogy on Display v3.0
118 PCTalk (.exe) V2.1 Host III QModem Dialer
119 NewKey v2.1, 3 Kermit V 2.27
120 Investment Record System, Check Reconciliation, New Fonts, Menu Generator
121 General Ledger Accounting, Merge Plan, Multiplan Consolidator, Misc. Utilities
122 Symphony Applications, Medical, Banking Worksheets
123 Lotus Graphics Printer Symphony Insurance Worksheets
124 Lotus 123 Worksheets, Macro Conversion Aid
125 3x5 Info Management v1.0
126 File Express v2.95 1 of 2
127 File Express v295 2 of 2
128 Prolog v1.32 Spacewar Game, Bluesbox-Music Generator
129 Xlisp v1.4
130 PC Write v2.4
131 PC-DBMS v1.0
132 ORIGAMI, Color Graphics and Japanese Paper Folding
133 Personal Management — Deskmate V1. — Partner V1.I
134 Label Master
135 PC-Magazine Laboratory Bench Mark Series #1
136 Personal Accounts Manager V1.I Disk #1
137 Personal Accounts Manager V1.I Disk #2
138 RBBS V12.5A Capitol-PC — Vol 1 of 2 system
139 RBBS V12,5A Capitol-PC — Vol 2 of 2
140 PIBT Term V2.0 — Terminal Emulator, Juidy V1.01 Desktop Utilities
141 PC-CALC and AModem
142 Misc Utilities, Archieve, Examine RAM, List & File Managers, UnsQ
143 PC-TALK III V2.2 — Termulator V1.0 Kermit/SModem V3.2 Minitel
144 Misc Utilities, Create Bat, Bly's Uts. , SciCalc, Capstock, File Encrypt
145 1,2,3 to dBase III, TurboPascal Patches, WS P)atches, Double DOS V1.0
146 XLisp V1.5
147 Fun & Games
148 Potomac Eng 1 of 2, Database, Spreadsheet Expert System
149 Potomac Eng 2 of 2, Database, Spreadsheet, Expert System
150 Flow System Organizer, Visible Pascal
151 Misc Utilities, Auto Dex, CHKDSK, Diskcopy, Screen Ed, REN, WS Convert
152 Confident V2.0 Encryption Pgm, Symphony Macro Conversion
153 Fun & Games
154 Small Database, SDB V2.0 — Ron Cains SMALL-C V1.1
155 RBBS V12.5b Capitol-PC
156 TBBS V12.5b Capitol-PC
157 Prolog. Artificial intelligence Sample
158 AnalytiCalc-86 — Vol 1 of 2 — Integrated Spreadsheet
159 AnalytiCalc-86 — Vol 2 of 2 — Integrated Spreadsheet
160 Geneology on Display V3.1
161 Fansi-Consol V1.11/1.13 — Consol Driver
162 Personal Typing, S-Ray, OmniEdit, DOS Assistant V2
166 PFSA Program for Simple Algebra
167 PCWrite V2.55 Word Processor & Editor
168 pBase V1.02, PC-Recipe, SL-Sidelines (dBase III)
169 The Mailman V2.0 — Mail List Management, Learn V.06
170 PIBTerm V3.0 VT100 Terminal Emulator, Butler V1.03 Commercial Communications
171 Escreens. Create interactive Color Graphic Screens
173 ChiWriter V1.3 SCI Notation Word-Pro, BradFord V1.2
174 ESIE V1.1 Expert System interface Engine, Comet Finder
175 ZModern V1.12 TryVmsym V1.1 for Symphony, Proindex V1.2
176 Church Management and "She Expert," a knowledge system
177 PD Labels, Letterwriter — An address book, DOS-amatic.
178 Games; Cavequest, Naval War Simulator, ARROR - Turtle graphics.
179 BENCHMARKS from PC Magazine Lab Series No. 2
180 ACCUTAX 86 — 1985 Tax Preparation System.
181 PC DPS-KAT Vs. 1.2 — A super capacity disk cataloger.
182 FREEWORD Vs. 1.0 — A word processor.
183 PROLONG PD Vs. 1.8 — Artificial intelligence;
184 PC-Tax 85 — 1985 Tax Preparation System.
185 Z-80 CP/M 2.2 Emulator for PC-DOS.
186 NYWORD — Word Processor; WSID — Wordstar5 index system.
187 QMODEM Vs. 1.13 VINTRO — Tutorial on NEC V20/V30 CPU.

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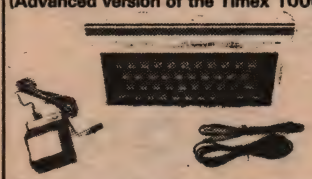
PC 8300 HOME COMPUTER
(Advanced version of the Timex 1000)



42-key mechanical keyboard (not membrane). Contains 2K of RAM.** Reverse video, Z80A, 6.5 MHz processor, ROM 8K BASIC. Graphics capability/sound–music, TV or monitor. Joystick input operates on 115 VAC. Includes: AC adapter, TV cable, and pair of cassette cables. Will run all prerecorded tapes for Sinclair/Timex 1000-ZX81. Mfr — Power 3000.

Item #10336 **$29.95** New (in orig. boxes)

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(1 available per each customer.)
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3½", 10MB HARD DISK DRIVE

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Fits standard 5¼" spacing. Shock mounted. High speed, low power.
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5¼", 1.2 MEG, AT HALF HT. DISK DRIVE

48/96 TPI (IBM® Compatible)
Double sided, single/double density; 80 track
Mfr — Panasonic #JU-475
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Double sided/double density, full height drive. 48 T.P.I., 80 tracks. Mfr — MPI #52S
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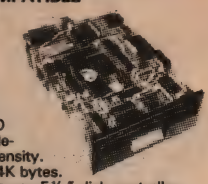
96 TPI, DS/Quad Density
Mfr — CDC #9409T
Item #1893 **$99.00**

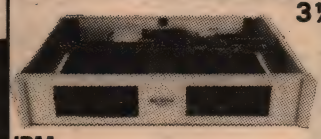
IBM® COMPATIBLE 3¼" DISK DRIVE



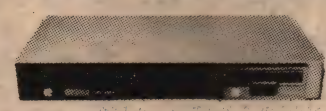
Tabor TC-500 drivette. Single-sided, quad density. Capacity: 164K bytes. Will work with any 5¼" disk controller.
Item #8824 ~~$79.95~~ **$49.95** New
*Total cap. 500K bytes with special software.

3¼" DISKETTES (Pack of 5)
Item #9495 **$9.95** New

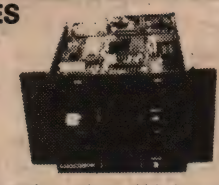
3¼" DISK DRIVE EXPANSION MODULES



IBM PC Jr.
Side-by-side mounting (PC Jr. mounts on top). With floppy disk drive controller board. Contains: 2 Tabor TC-500 3¼" disk drives. Total cap. 360K. Item #8825
~~$199.00~~ **$99.00** New



APPLE
Side-by-side mounting with disk storage space in front. Floppy disk controller board capable of handling four disk drives. Contains: 2 Tabor TC-500 3¼" disk drives. Total cap. 360K. Item #8826
~~$199.00~~ **$99.00** New



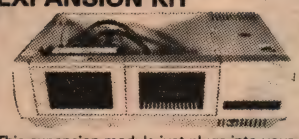
IBM PC/XT
Stacked mounting, replaces old-fashioned 5¼" disk drives. Contains: 2 Tabor TC-500 3¼" disk drives. Total cap. 360K. Plugs right into your controller. Item #8827
~~$169.00~~ **$99.00** New

Each unit supplied with two 3¼" flexible diskettes.

190W DISK DRIVE POWER SUPPLY

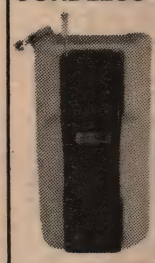
Input: 115V
Output: +12V @ 4.13A, +5.1V @ 3.04A } x 3
Contains 3 sets of dual outputs, allowing for simultaneous operation of 3 disk drives. Originally designed for the AT & T computer.
Dim.: 11"W x 4½"H x 7"D
Item #10006 **$59.95** New

COLECOVISION to ADAM EXPANSION KIT



This expansion module just plugs into your ColecoVision. With Printer Power Supply and data drive (both included), you will have a working Adam Computer. Adam Keyboard, one Smart basic cassette and hook-up diagram also included.
Item #9918 **$59.50**

CORDLESS TELEPHONE



700 ft. Range
Wall or Base Mount

Full duplex: talk & listen simult. Auto redial: last number dialed recall. Comes with attachments for both types of mtg.; incl. AC power adaptor & battery indicator light. Color: brown w/cream. Famous make mfr.
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EMI FILTER 6 Amp., 120/240 Volt

Provides the most effective attenuation of 'line-to-ground' and 'line-to-line' noise across the frequency range.
Dim.: 2.62" x 1.98" x .81".
Mfr — SAE (equiv. to Corcom type 6ECI)
Item #10959 **$4.95; 2 for $9.00**

HI-POWER SWITCHING POWER SUPPLY

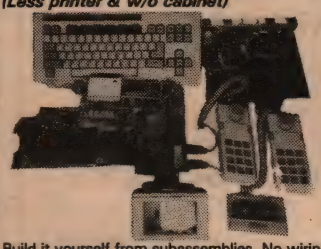
Output: +5.15V @ 70A
+12V @ 4A
+12V @ 4A
+5.2V @ 5A
Input: 115/230V nominal, .725KW cont. 47–63Hz. Enclosed in metal housing.
Dim.: 15"W x 2½"H x 6"D.
Mfr — Todd Prod. #4XS8151A
Item #9749 **$29.95** New

Composite Video Monitors

12" MONITOR
(Controls front panel mounted)
12", green phosphor, high resolution (12 lines center) and bandwidth from 10Hz to 30Hz ± 3dB. Op. volt.: 120/240VAC, 50/60Hz., 65VA max. Controls front panel mounted.
Mfr — Motorola – Alpha Series
Item #10043 **$29.95** New

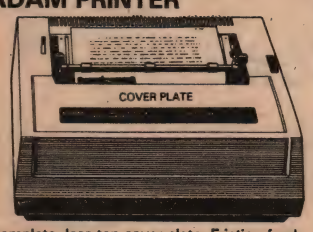
15" MONITOR
15" screen. Same specs as above.
Item #10044 **$34.95** New

ADAM COMPUTER KIT!
(Less printer & w/o cabinet)



Build it yourself from subassemblies. No wiring necessary (just plugs together). Hook-up diagram included. Includes: Keyboard, 1 cassette digital data drive, 2 game controllers, power supply, all memory boards, and one cassette. Is capable of running CP/M, has built-in word processor.
Item #7410 **$99.00** (complete)

ADAM PRINTER



Complete, less top cover plate. Friction feed. Takes standard paper 8½" x 11". (Customer returns; tested — operational.)
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PRINTER POWER SUPPLY
Item #6642 **$14.95**

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Item #6643 **$19.95**

CONTROLLERS (set of 4)
Item #7013 **$9.95**

ASSORTED CASSETTES
Item #7786 **$19.95**

27 CFM MINI FANS

115VAC; 50/60Hz.; 12W. Low noise level fans, can be mounted for blowing or exhaust.

1" Thin — contains 9 plastic blades. Dim.: 3⅛" sq. x 1" deep
Mfr — Tobishi #U9201B
Item #10960 **$7.95** New

1½" Standard — contains 7 metal blades.
Mfr — Rotron #SU2A1
Item #5970 **$7.95** New

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COMPUTER & GAME EQUIPMENT INTEGRATED CIRCUITS

MINI MICRO-COMPUTER REGULATOR

140 VA

Provides voltage regulation and ultra-isolation for microprocessor-based equipment. Contains less than 3% harmonic distortion, better than 60 dB traverse noise rejection. Contains dual outlet for CPU & monitor, and 6 ft. line cord.
Input: 95 — 130V, 60Hz.
Output: 120V @ 1.17A
Dimensions: 11⅞"L x 4⅜"H x 5⅝"W
Mounted on metal base with rubber feet.
Mfr — Sola #63-13-114
Item #9999 **$99.00** New

COMPUTER GRADE POWER SUPPLY

Other uses: runs CB & car radios. Comes ready to plug in!
DC Output: −5V @ .5 amp.
+5V @ 3 amp.
+12V @ 6 amp.
Input 115V/60H. Dim.: 9¼"W x 3¾"H. (Rubber ft. incl.)
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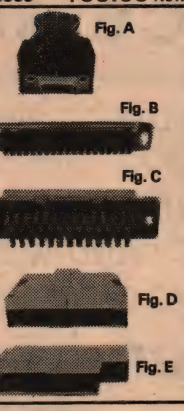
D-Subminiature Solderless Connectors, Crimp Terminals (Mfr — TRW)



		9-Pin		15-Pin		25-Pin		37-Pin	
Description	Fig.	Item #	Price	Item #	Price	Item #	Price	Item #	Price
Hood w/Metal Male	A	10998	$1.29	11001	$1.39	O/S	$1.69	11002	$2.09
Hood w/Metal Female	A	10999	1.49	11000	1.49	O/S	1.79	11003	2.19
Hood w/Plastic Male	A	11004	1.19	O/S	1.29	11007	1.59	11005	1.99
Hood w/Plastic Female	A	O/S	1.39	O/S	1.49	11008	1.79	11006	2.19
Chassis mount, Metal Male*	B	10747	.79	10745	.89	10735	1.19	10752	1.59
Chassis mount, Metal Female	B	10746	.89	10734	.99	10711	1.29	10888	1.69
Chassis mount, Plastic Male**	C	10890	.69	10910	.79	10732	1.09	10891	1.49
Chassis mount, Plastic Female	C	10728	.79	10731	.89	10724	1.19	10729	1.59
QC Hood w/Metal Male	D	11025	1.39	10029	1.49	11033	1.79	11037	2.19
QC Hood, Rt. Angle w/Metal Male	E	11026	1.39	11030	1.49	11034	1.79	11038	2.19
QC Hood w/Metal Female	D	11027	1.59	11031	1.69	11035	1.99	11039	2.39
QC Hood, Rt. Angle w/Metal Female	E	11028	1.59	11032	1.69	11036	1.99	11040	2.39
QC Hood w/Plastic Male	D	11009	1.29	11013	1.39	11017	1.69	11021	2.09
QC Hood, Rt. Angle w/Plastic Male	E	11011	1.29	11015	1.39	11018	1.69	11022	2.09
QC Hood w/Plastic Female	D	11010	1.49	11014	1.59	11019	1.89	11023	2.29
QC Hood, Rt. Angle, w/Plastic Female	E	11012	1.49	11016	1.59	11020	1.89	11024	2.29

QC = Quick connect; *Without mounting device; **Can be used with quick connect hoods

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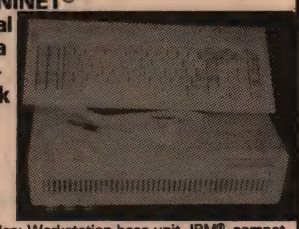
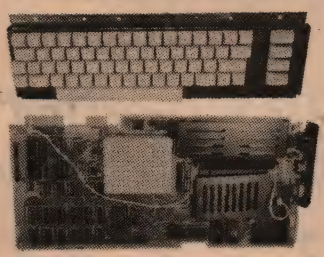
IBM® PC Compatible Workstation for CORVUS OMNINET® Local Area Network



Includes: Workstation base unit, IBM® compatible keyboard, tap cable & box. Contains serial interface for printer or modem. Operates on 115V/60 Hz.
Item #11041 **$199.00** New

Insides of the COMMODORE COMPUTER



Commodore VIC 20 CPU board & mechanical keyboard. Guaranteed not to work. (For parts only.)
Item #15000 **$14.95** RFE

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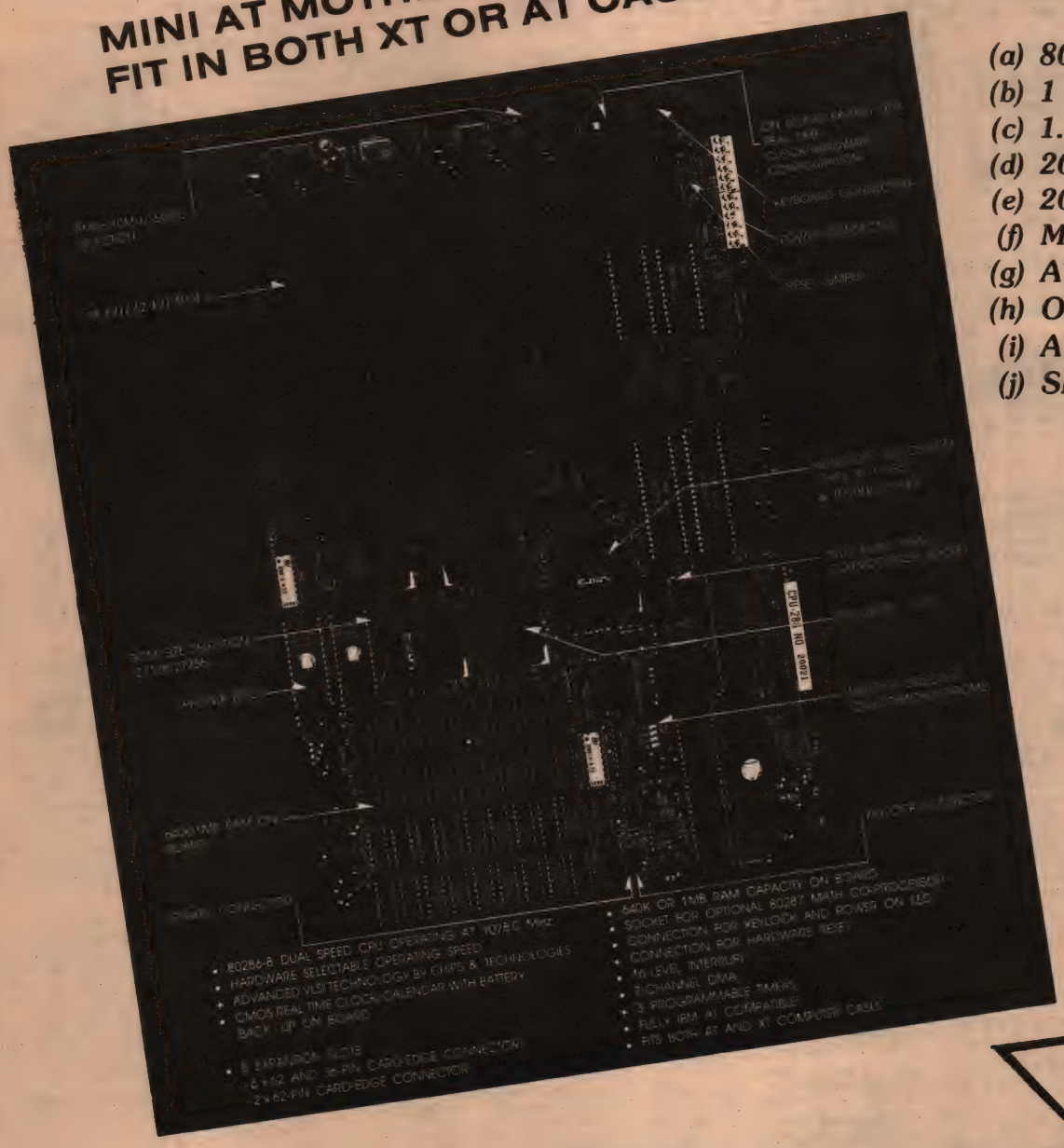
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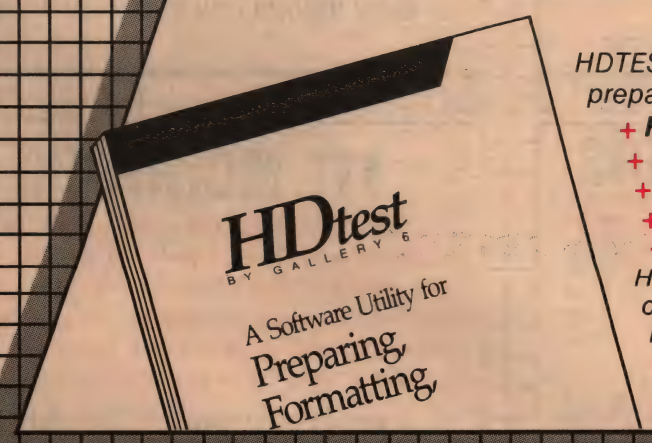

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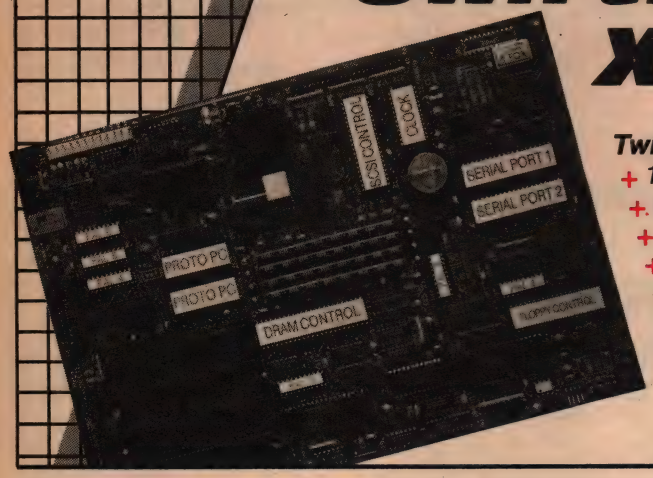

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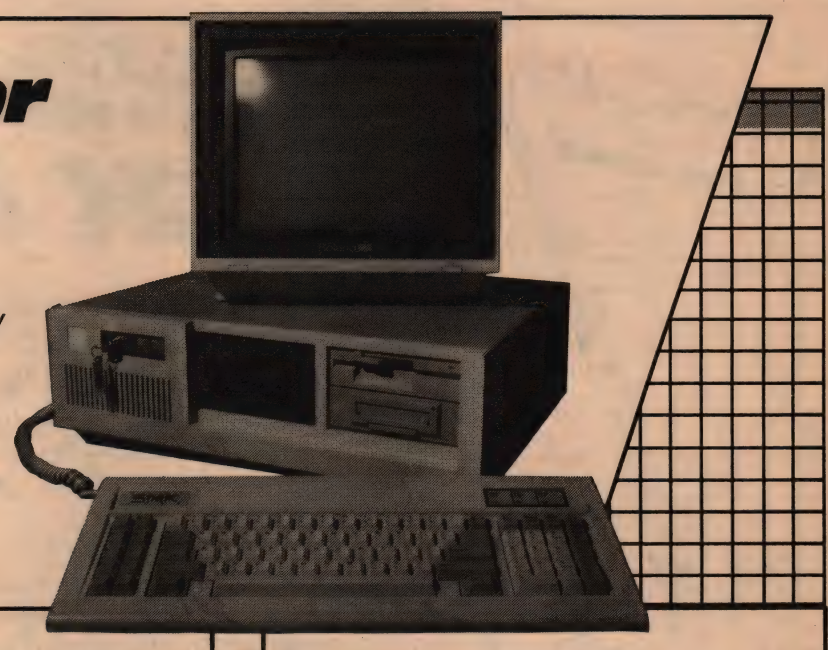

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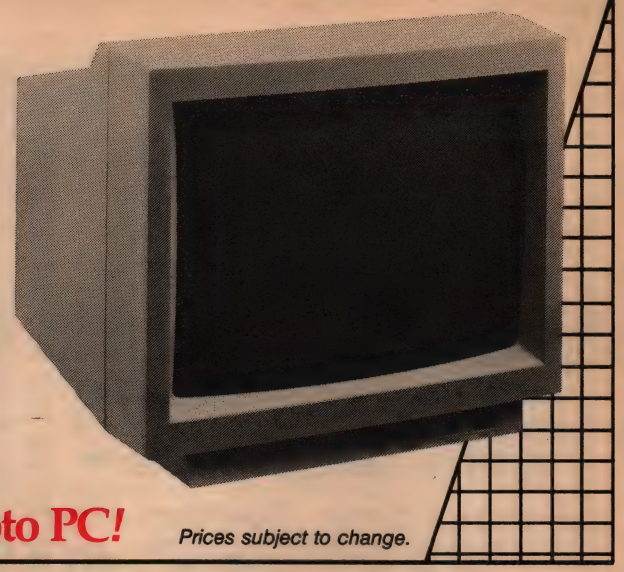

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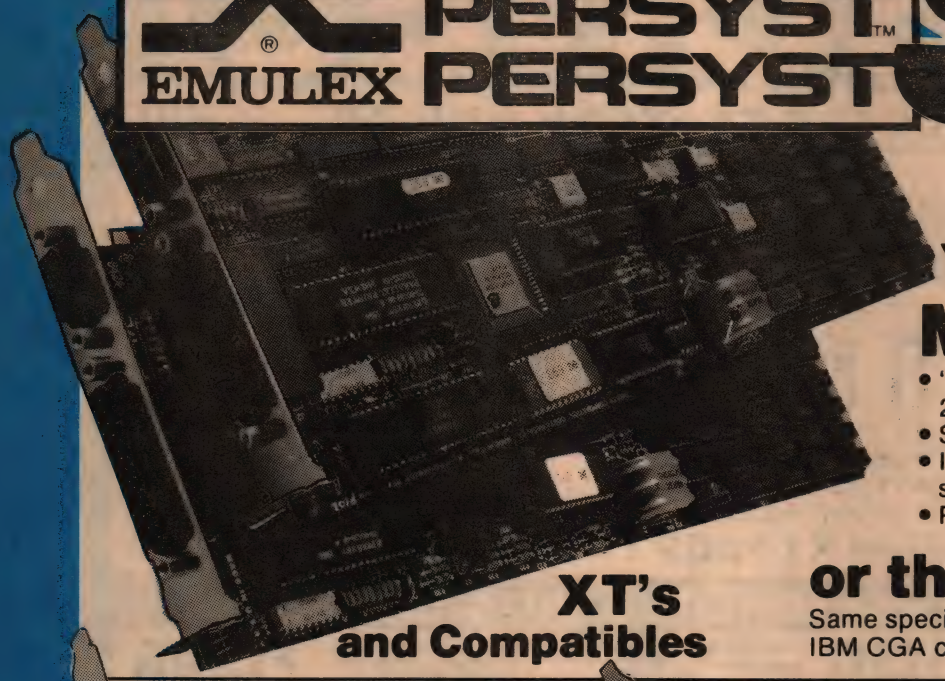

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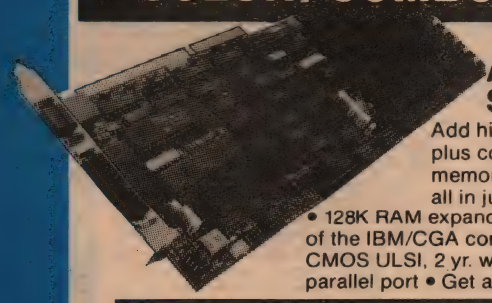

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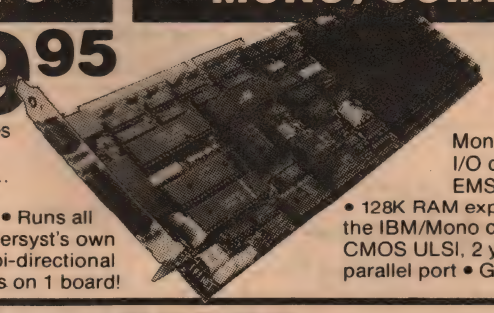

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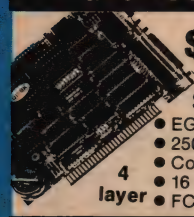

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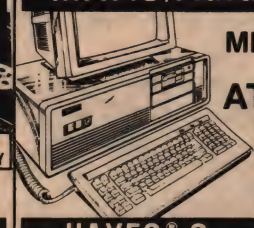

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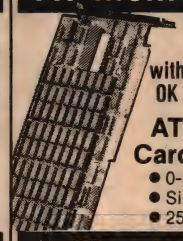

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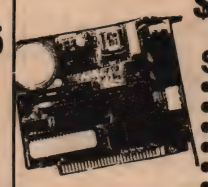

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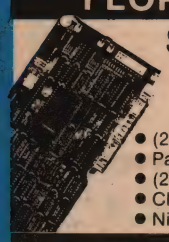

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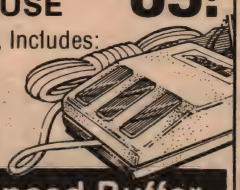

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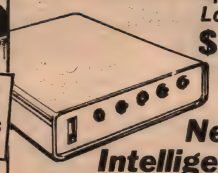

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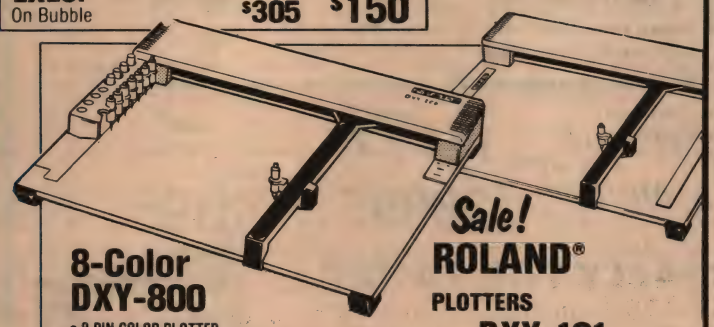

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the 5 most wanted configurations now available at special low prices... WHILE SUPPLY LASTS!

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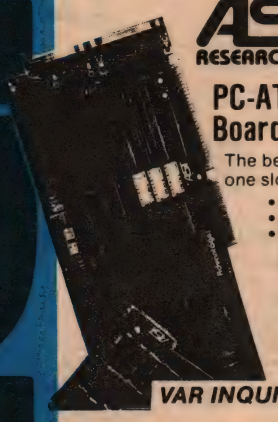
FOR "0" KB RAM ON BOARD

RAM On-Board	ACP SALE	Reg. List
512 KB RAM	359.	695.95
2 MB RAM	549.	1495.95



AST RESEARCH INC. Advantage AT 3 Mb RAM!

PC-AT Multifunction Expansion Board with extra I/O, Software

The best of the expansion boards! Takes only one slot yet has all these features...
- Includes built-in Serial port and Parallel port
- Uses piggyback Advantage-Pak for up to 3Mb RAM
- Complete with 3 Super Software packages... DESQview...a full-featured windows environment SideKick®...by Borland International, provides valuable desktop accessories AST's SuperPak®...SuperDrive®, SuperSpool® and FASTdisk® providing floppy and hard disk emulation in RAM memory

All Boards Factory Populated With 150ns Rams. Card is Specified To 6MHz.

1.5 Mb RAM **489.** Reg. List 1045.95

3.0 Mb RAM **699.** Reg. List 1745.95

3 REASONS TO ADD 3Mb TO YOUR AT
1. **Unix & Xenix** Operating Systems
2. **RAMDISK** 3Mb Of High Speed Ramdisk Memory Access.
3. **ABOVE BOARD™** Emulation. Yes, You Can Have Intel Above Board™ EMS Compatibility. (Requires "Above Disk" Software, Add $69.00)

VAR INQUIRIES WELCOME, CALL 714-558-9058 ask for Van, Jerome or Scott

Accelerate your PC/XT!

See... INFO WORLD Special Report Dec. 1, '86

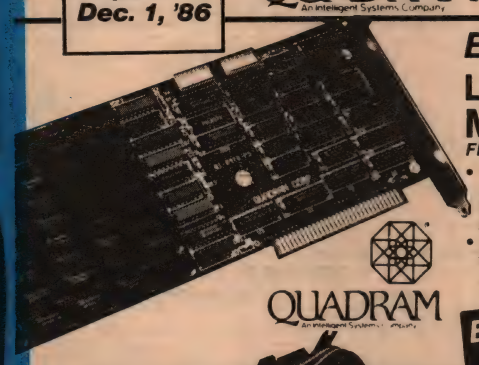
Quad Sprint QS 5000™

Quadram's powerful accelerator card easily doubles the speed of your IBM PC/XT or compatible...
- Simple plug-in installation
- Transparent-EGA compatible
- No changes to current memory

ACP's sale only **199.95** suggested retail $345.00!

How it works...the stock 4.77 Mhz 8088 is upgraded with a 10 Mhz 8086 CPU that works together with a special built-in RAM cache memory buffer...resulting in speed increases (depending on software) of easily 170%-240%, even as much as 400%!

Expanded memory for your PC/XT!

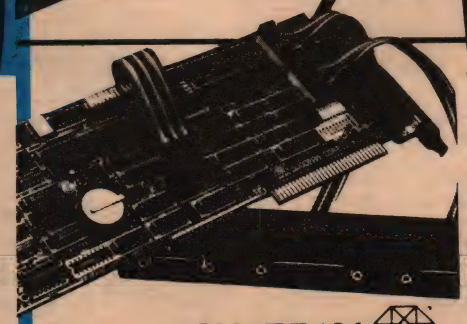


Liberty PC™ MG 0000
FREE YOUR MEMORY
- Full compatibility with Lotus/Intel/Microsoft/ Expanded Memory Specifications And Intel Above-board®
- QuadMaster utility software features RAMdrive software, printer spooler, much more!

ACP Sale **169.00** suggested retail... $300!

Expandable To 2MB!
- with 512K, add $60. (256K CHIPS)
- with 2 Mb, add $239. (256K CHIPS)

Silver Quadboard Sixpack™ for PC/XT!



Silver Quadboard SQB 000™

The Silver Quadboard saves valuable PC slot space, combines the most needed & wanted features on one board PLUS the added bonus of more memory and ports!

WOW! Includes...
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- 1 Parallel Port
- Clock/Calendar
- 1 Game Port
- QuadMaster™ Software with RAM drive software, Printer spooler and more!
- Up to 640K using 64K or 256K chips

ACP Sale **129.95** suggested retail... $370!

- SET OF 64K DRAM $10.95
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for 384K use (1) 256K kit & (2) 64K kits, for 640K use (3) 256K kits

FREE! PolyWindows DeskPlus™ desktop management software INCLUDED...

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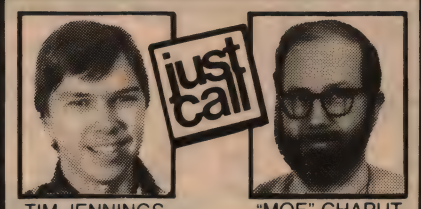
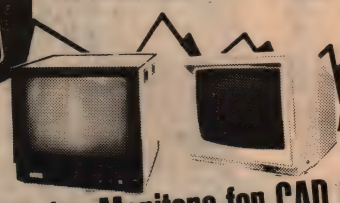


TIM JENNINGS "MOE" CHAPUT



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Mitsubishi FROM $375. *Ikegami* FROM $400.

MITSUBISHI C3919 (-LP) 15.5 – 23.5KHZ Hor. 40 – 70HZ Vert. 50HZ – 25MHZ BW. (Approx. 768 x 512 Max. Res., 4000 char.)

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Brand New IKEGAMI 14" Color Monitor, same spec as CDA 203 except Approx. 1024 x 768 Max. Res. $329.00. (limited supply of cases avail.)

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8" "Winchesters"

5, 10, 20, 40 Meg

Shugart SA-1000 I/O Compatible

Tested & Untested, Less P.S. Case *plus* Cables

Quantity Pricing Available

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Shugart SA-1002, 5 Mb, Tested and Untested	*From*	59.

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Epson Printers Move Quickly – Call For Current Stock!

Burroughs R-3 Word Processor Systems, tested oper'l, w/o printer		$695.
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DEC LA/LS Printers, untested, off lease		$200.
Kennedy Tape Streamers, Mod 6255, untested		$250.
Universal "Smart" Print Buffer,	New	$199.
CDC 9410 8 in. "Wini" 80 Mb, Lark LDI I/O, Schematics incl.		$189.
IBM PC Controller, New with manual		$149.
DEX 4100 Fax Xmits & receives documents, copier too 2 min. to 6 min/page. May require data coupler		$149.
CDC Hawk 9427H-R 14" Cartridge 5 meg fixed, 5 meg removable	from $295.	Unused $950.
"Selectric" Typewriter/Printer, Par. TTL I/O (info to build Centronic I/O included)	Used I/O $119.	Unused I/O $126.
GE Terminet Band Printer, up to 120 cps, ULC RS232 KSR 2 for		$249.
RO 2 for		$199.
Keytronix ASC II TTY Kydbs. +5VDC 8 Bit w/strobe, 10 Kybd.	Unused	$9.95 $14.95
Data Products Drum Printers, 2230 Lpm, 2260 600 Lpm, 2290 900 LPM		from $195.
Used RS232 ASC II Terminals, whole, clean, tested & untested		from $49.
LMBDA Power Supplies, 105-132V, 57-440HZ, 5VDC @ ± 12VDC ±15VDC		$40. – $100.

DATAPRODUCTS DRUM PRINTERS

REDUCED!! from $195.

2200 SERIES

2230 300 lpm	$195.00
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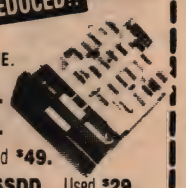
2290 900 lpm	$2295.00

SHUGART Floppy Drives REDUCED!!



Used, whole, untested less P.S. & Case, most RFE.

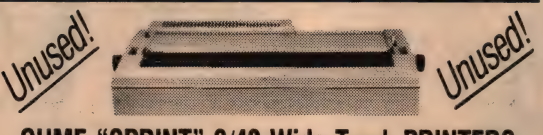
Tandon TM100-2, 5¼" DSDD	Used $45.
CDC/MPI 9409, 5¼" DSDD	Used $45.
MPI Model 52 & 52S, 5¼" DSDD	Used $49.
Shugart SA-901 (Sim to SA-800/801) 8" SSDD	Used $29.
CDC/MPI 9404 8" SSDD	used $29.
CDC/MPI 9406 8" DSDD	from $59.
Shugart SA-851, 8" DSDD	Used $89.
Shugart SA-801, 800-2, 8" SSDD, Untstd. $75., T&O $125.	Unused $150.

DIABLO 620 RS-232 Serial Printers .....

DIABLO 1610 Daisy Terminals ..... Only $295

DATA TECHNOLOGY CONTROLLER SA 1403D, Supports 4 hard or floppy drives. SA 1000, SA 850, 851, SA 800, 801 I/O (SASI Output) $175.

CDC 9410-3 24 Meg "FINCH" Winchester Hard Disk Drive Use w/SA 1403D SA 1000 Style Interface $249.



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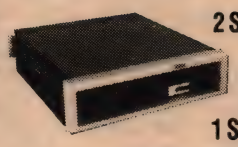
UNIVERSAL *"SMART"* PRINT BUFFER – NEW! $199.



2 Shugart 801 Disk Drives 8" SSDD w/Case & P.S., Rack Mountable Used $160. Unused $250.

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Uses Xerox Metal Wheels or Plastic Wheels OEM Interface, 13 Bit Parallel. Requires ± 15V @ 5A & 5VDC @ 5A, 35-40 CPS 10 & 12 Pitch and P.S.

Spare P.C. Board Set (6 P.C. Cards)	$249.00
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RS232 Serial & Centronics I/O Parallel For Above	295.00

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Like New, Tested, Operat ... $795 ea.

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Unused in Orig. Carton .... $395 ea.

Tested, Operat **Buy 2 Get 1 FREE**

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G.E. "TERMINET" 340 ASCII "BAND" LINE PRINTERS

115VAC, 60HZ, 132COL, 340LPM (64 Char) 230LPM (96 Char)

OEM SERIAL, untested, "As Is"... $195. ...Tested $595.

RS232 or Centronics Parallel, tested, oper. ..... $1995.

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LOOK! **MAXIM +5VDC Powered Dual RS-232 XMTR/RCVR** 16 Pin Plastic Dip. Single voltage, no need for ±12VDC $7.99

Printer Cables, Centronics or IBM PC Parallel	6 ft. $15.00
Quantity Pricing Available	10 ft. $19.00
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Quantity Pricing Available	
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Quantity Prices Available	

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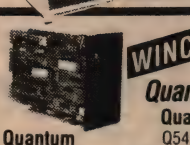

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Quantity Pricing Available

Quantum Q2020	Quantum Q540 5¼" Used	Quantum Q540 5¼" Unused	Quantum 2040 8" (40Mb)
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SPECIAL DISCOUNTS on sales $300 - $1000. Refer to Ad A87

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Cipher Dual-Density Streaming Tapes	from $500.
Data Products B-600, in Acoustic cabinet	from $5000.
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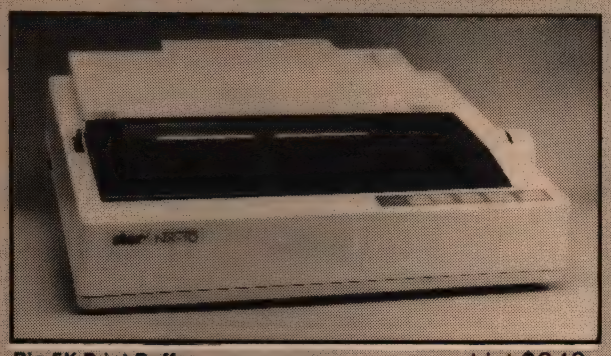

Big 5K Print Buffer

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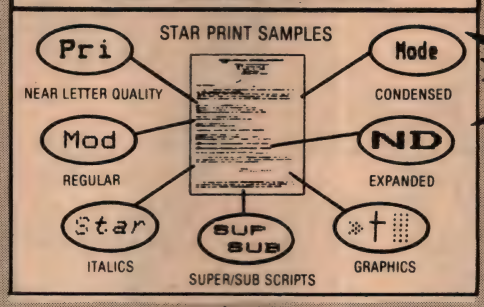

Fine Near-Letter-Quality, 100% compatibility and total reliability all in an easy-to-use printer!

NEW star NP-10 PRINTER
From MidWest Micro

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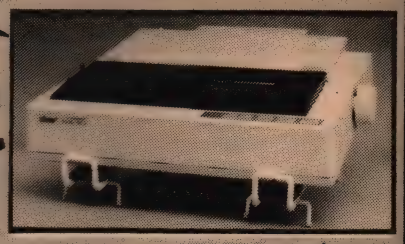
JUST ~~$199~~



List $279

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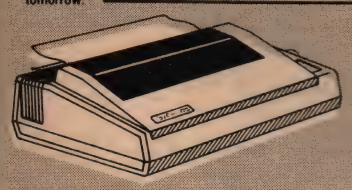
If you are looking for a top quality printer at an affordable price, you've found both in the new Star NX-10. The NX-10 operates bi-directionally at 120 CPS and includes many special features such as near letter quality printing, a huge 5K print buffer and easy access format switches for a wide range of character modes and character sets. You get friction feed for single sheets and tractor feed for fanfold paper. Another special feature is IBM graphics printer emulation.

All this makes the new NX-10 versatile enough for home or office. The NX-10 is easily interfaced with all popular computers such as IBM, Apple, Atari, Commodore, Sanyo and Zenith. Breakdowns are virtually unheard of with the NX-10. It is manufactured by a leading company with over thirty-five years of micro-precision experience for quality and reliability.

Whatever your personal computer...Star's NX-10 provides reliable and flexible performance meeting your needs today...and tomorrow.



star NX-15

ONLY $349

- Tractor and Friction Feed
- IBM and Epson Compatible
- Outstanding Print Quality and Performance
- High Speed Draft and High Density NLQ Printing

Get the Star Micronics advantage and the proven performance of the new NX Series. This new 15 inch model replaces the SG-15 and is manufactured to handle those large reports and spreadsheets. And word processing is a snap with the built-in near letter quality mode. The NX-15 even comes standard with an eight page print buffer to save you time and money. Call Midwest Micro to get yours today!

Full Featured NP-10 Printer

- **Quality Printing with Star Reliability**
- **Both Fine Near-Letter-Quality and High Speed Draft Printing**
- **Ease of Operation with Front Panel Switches**
- **Friction and Tractor Paper Feed Standard**
- **Auto Paper Feed**

For ease-of-operation, dependability and unparalleled price performance, nothing beats the New Star NP-10. You get outstanding print quality at 100 cps in draft mode and 25 cps in near-letter-quality mode. The NP-10 is ideal for small business, educational and home use with its easy front panel operation. With the NP-10 you simply touch a button on the control panel to print in either draft or near-letter-quality modes. And it only takes a flip of the paper release lever to automatically feed single sheets into the Star NP-10. Unlike other printers at this price, the NP-10 comes with an adjustable tractor as well as friction feed. Other standard features include a clean, long-life ribbon cassette, forward and reverse microfeed and a nationwide service network. It all adds up to the Star NP-10 as a great printer choice.

Complete star Line . . .

The Star printer line includes a number of fast, efficient and cost-effective models. Call MidWest Micro and let us help you select one today!

	List	Sale
NP-10 (New 100 cps, NLQ, 80 Col.)	$279	CALL
NX-10 (New 120 cps, NLQ, 80 Col.)	349	CALL
NX-15 (New 120 cps, NLQ, 132 Col.)	499	349
ND-15	649	CALL
NR-15	799	CALL
SD-10 (160 cps, NLQ, 80 Col.)	499	289
SD-15 (160 cps, NLQ, 132 Col.)	599	389
SR-10 (200 cps, NLQ, 80 Col.)	649	419
SR-15 (200 cps, NLQ, 132 Col.)	799	899
NB-15 (300 cps, 100 cps, NLQ.)	1349	899
NB24-15	1195	619
PowerType (18 cps Daisywheel	499	199
Star Printer Ribbons	AS LOW AS $16 PER DOZEN	

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We are one of the biggest marketers of printers for microcomputers and can assure you that you are saving hundreds of dollars without giving up a single benefit.

We have only a limited number of these printers, so call now for your best chance of getting in on this "once in a blue moon" deal.

We at MidWest Micro will continue to do our best for you. Thank you for your generous patronage.

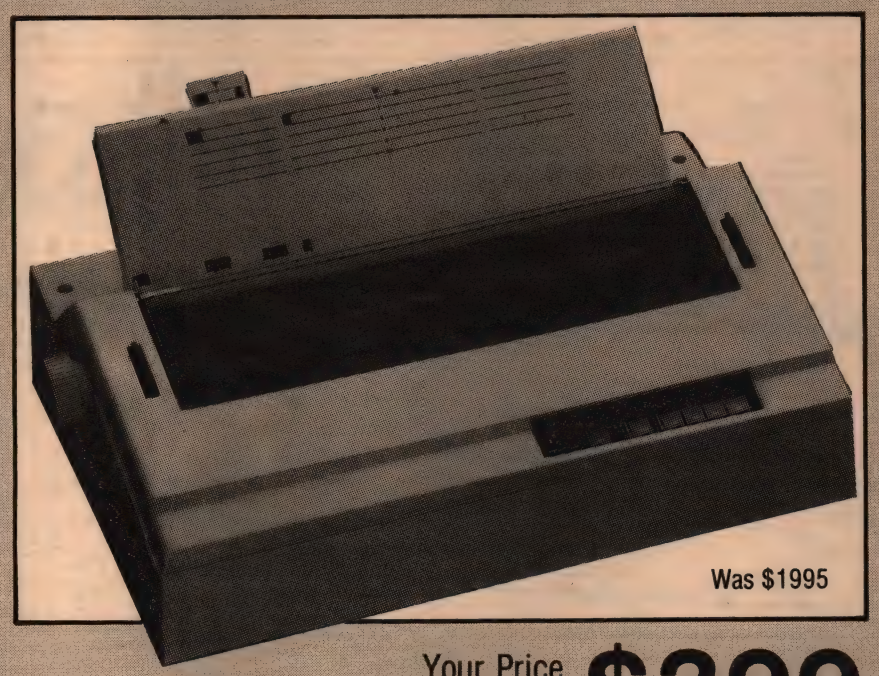
Sincerely,

Mark Runkle
President
MidWest Micro

Computer Shopper Reader Service
Best Buy
OF THE YEAR

MidWest Micro
Winner of Computer Shopper's Best Buy Award for Impact Printer

Now you can get a full featured, wide carriage, 36 cps daisywheel printer . . .
Mechanically identical to the BROTHER HR-35



Your Price Just **$399**

2+ $369
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This top-of-the-line daisywheel printer is made by a major market leader in daisywheel printer products. Its quality and durability are well known. Through special arrangements we are offering it to you direct. The price is far below the dealer quantity 100 price level. We fully support the product and make available all accessories that you may want for it. When this printer starts printing, hang on to your keyboard. It sprints through correspondence at a rapid 36 characters per second – that's one-third faster than the average daisywheel printer.

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- Superior performance
- Fast 36 cps Print Speed
- 7 K Print Buffer

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It is exceptional in many other ways. The 15½" wide carriage briskly prints all your ledgers, spreadsheets, and extra wide business graphics with ease. With the optional cut sheet feeder and tractor feeder, you can print several copies on your letterhead and switch to pin-fed paper for high volume word or data processing.

The 7K buffer holds a substantial amount of data while its printing.

The average life of the print wheel is 10 million characters. Which means that you can run it eight hours a day — every day of the week — for almost two full years. Of course, under more normal usage, it will handle your business correspondence and graphics for up to five full years without service. That's impressive.

Quiet quality.

What your eyes don't tell you, your ears will. Because this printer is much quieter than many more expensive printers. So you can keep the noise down while you keep the cost down.

SPECIFICATIONS

Print Speed	36 CPS (Shannon text)
Print Wheel	96 petals/wheel, cassette type, ASCII stand.
Print Wheel Life	10 million char./wheel
Characters/Line	132 characters (1/10"), 158 characters (1/2"), 198 characters (1/15")
Paper Width	16.5 in max (419 mm)
Copy Capacity	Original (45 kg) + 4 copies (15 kg) (total thickness 0.35 mm max.)
Carriage Motion	Bidirectional, logic seeking
Carriage Rtrn Speed	750 ms (at 13.2" return)
Line Spacing	6, 4, 3 lines/inch, 1/48" proportional increments
Paper Feed	Bidirectional, logic seeking
Paper Feed Speed	4"/second

Available Ribbons	Ribbon Life
Single-strike black carbon film	60,000
Multi-strike black carbon film	150,000
Single-strike black correctable film	70,000
Multi-strike black fabric	500,000
Single-strike red film	2,000
Correction tape	1,500

Interface	Standard RS-232C – Serial
Buffer Size	7K
Control Panel	Indicators: Select, Power, Alarm, Line, Pitch, and Copy (LEDs) Switches: Select, Line Feed, TOF, Line, Pitch, and Copy
Noise	Operating – Less than 65 dB
Temperature	50 to 105 F – 10 to 40 C (operating)
Humidity	20% to 80% non-condensing (operating) 5% to 90% non-condensing (storage)
Power	120 V, 60 Hz (Optional: 120 or 220 - 240 V, 50/60 Hz) 130 W Max.
Dimensions	21.18 (W) x 7.65 (H) x 15.15 (D) inches (538(W) x 194.5 (H) x 385 (D) mm)
Weight	33 lbs (15 kg)
Optional Features	Tractor feeder, Auto Cut Sheet Feeder, Single and Multi-strike ribbons, Interchangeable printwheels (Numerous languages and typestyles)

RIBBON CARTRIDGES ..... **As Low As $2.79 each**
FORMS TRACTOR (Fits CR-4, Datasouth DW-36, Brother HR-25/35. ..... **$119**
AUTO CUT SHEET FEEDER (Fits CR-4, Datasouth DW-36, Brother HR-25/35) **$129**

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Dear Valued Customer,

Thank you for your continued confidence in our ability to be your best source for microcomputer printers. We at MidWest Micro know that we must continue to earn your loyalty with the best possible products and savings.

It is therefore with great delight that I offer you the new Seikosha SL-80AI. It offers you the versatility of 24 pin printing combined with a large print buffer and both Epson and IBM compatibility. To be able to offer this much printer to you for less than $400 makes me feel very good about our ability to earn your confidence and continuing support.

The value offered by the SL-80AI may cause some spot shortages, so call early and please excuse any delays in shipments that may occur. Our trained sales people are waiting to help you, so call today!

Sincerely,

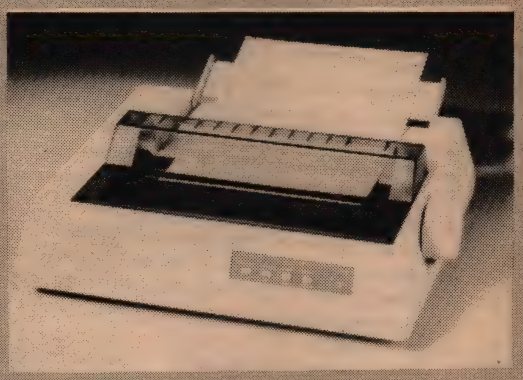
Mark L. Runkle
President
MidWest Micro

VERSATILITY, EXCELLENT PRINTING QUALITY, THE REAL 24-PIN PRINTER FOR LESS THAN $400... SO HERE IT IS!

SEIKOSHA SL-80AI

24-Pin Dot Matrix Printer

HATTORI SEIKO COMPUTER PERIPHERALS



ONLY **$379**

LIST $599

Computer Shopper Best Buy of the Year

MidWest Micro
Winner of Computer Shopper's Best Buy Award for Impact Printer

FEATURES:

- Fine letter quality printing by 24 pins
- Letter quality printing speed 54 cps
- 135 cps draft printing speed
- Featuring EPSON LQ® and IBM® mode (Optional with Epson LQ 800)
- Quiet even for executive office (as low as 52 dBA)
- Variety of printing styles – Double-Width, Bold, Double-Strike, Italic, Superscript/Subscript and Underlining
- 10 kinds of high resolution dot addressable graphic printing
- Automatic paper loading and ejection system
- Download character setting maximum 128 characters
- Switch margin setting by the front panel
- Built-in 16K buffer (Epson LQ 800 has only 7K)
- Optional Automatic Cut Sheet Feeder

SPECIFICATIONS

PRINTING
Printing Method: Impact Dot Matrix Method, Bi-directional (character printing) Uni-directional (graphic printing)
Print Head: 24 pins
Printing Speed: 54cps (LQ Elite), 45cps (LQ Pica)
Throughput: 53 ipm (Draft Pica)
Line Feed Pitch: 1/6, 1/8, 7/72, 7/60, n/60, n/72, n/180, n/216
Line Feed Speed: 6.7 lines/sec (6 lines/inch)
Character Sets: 185 characters and symbols, 49 international characters
Character Attributes: Double-width, Bold, Double-strike, Italic, Superscript/Subscript & Underlining
Acoustics: Below 52dBA (ISO/DIS 7779)

MEDIA HANDLING
Paper Weight: 15 to 20 lbs., (45 to 65 kg.)
Paper Width: 4 to 10 inches (fanfold and cut sheet)
Multipart Paper: Max original plus 2 sheets (total thickness 0.2 mm)

INTERFACING
Parallel: Centronics compatible
Buffer: 16K-byte buffer (2K-byte when download character is set)

INK RIBBON
Type: Special cassette type ribbon, Black #SP-80051
Life: 2.5 million characters

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COMPLETE SEIKOSHA LINE . . .

		Sugg. Retail	Your Price
PRINTERS			
SP1000I	IBM Parallel	$ 299	CALL
SP1000AS	Epson Serial	299	CALL
SP1000AP	Apple IIc / MAC	299	CALL
SP1000VC	Commodore w/Cable	270	179
SP1200AI	120cps, IBM & Epson	349	CALL
SP1200AS	120cps, Epson Compatible Serial	349	CALL
MP1300AI	300cps, IBM & Epson, Ser & Par	799	389
MP5300AI	300cps, IBM & Epson, Ser & Par	999	CALL
BP5200I	IBM Parallel, 200cps	1080	359
BP5420AI	Epson & IBM, Serial & Parallel	1849	999
SL80AI	24 pin 10" Carriage Epson & IBM	599	CALL
PRINTER ACCESSORIES			
	BP Series Cut Sheet Feeder	$399	$349
	MP1300AI Color Kit	155	125
PRINTER RIBBONS			
	SP Series Cartridge		CALL AND SAVE
	BP Series Cartridge		
	MP Series Cartridge – Black		
	MP 1300 Cartridge – Color		

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GoldStar Monitor Sale

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Friends,

It seems that there is a bit of confusion surrounding monitors and their selection. This is especially true of color monitors. How many colors? What horizontal by vertical resolution? Can I get a really good color monitor for less than $350?

In order to give you the right monitor at the right price, we had to first determine what was the main quality in a monitor for comparisons. As it turns out, the actual distance from the center of one dot to the next or "dot pitch" is the best parameter to compare. The "dot pitch" determines the continuity of your characters and graphs.

Secondly we had to find a manufacturer of outstanding quality and integrity who makes a major portion of the monitors for well known "name brand" product lines. A monitor is a precision instrument and no Johnny-Come-Lately would do.

After a thorough search, we found that by making a large commitment we could bring to you a premier product at a bargain price.

So whether you need one or one hundred quality computer monitors, call us now and do yourself a favor. Experience quality and affordability with Goldstar Computer monitors.

Sincerely,
Mark Runkle
President
MidWest Micro

GoldStar

Let MidWest Micro and GoldStar clear up your confusion and rescue your computer equipment budget.

IBM COMPATIBLE TTL
MONOCHROME VIDEO MONITORS

Acknowledged as superior, Goldstar Monochrome Video Display Monitors offer a wide selection, a wide array of features and are designed for the great variety of applications required by business and personal use. Extensive video experience has resulted in monitors of sleek design, rugged dependability and extraordinary quality. Goldstar monitors are unsurpassed in value and performance.

MBM-2015 GREEN

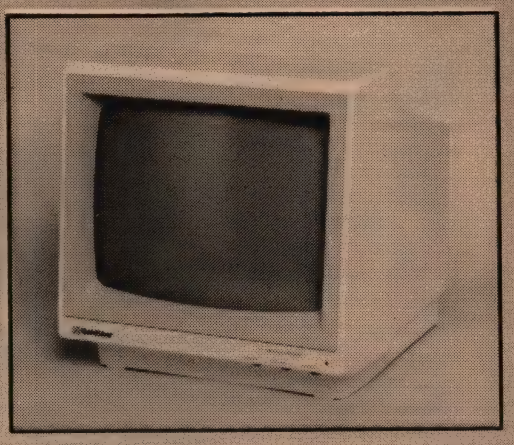
List $239 Just **$89**

This 12"display monitor is designed for IBM PC and other PC compatibles. The high resolution of 900 lines at center provides excellent character definition. Complemented by a non-glare, high contrast screen, the 2015 is easy on the eyes and excellent for extended viewing. The separate ttl input signals are accepted via a 9-pin connector, the standard connection to the IBM monochrome display card.

MBM-2015 AMBER

List $239 Just **$99**

This 12"display monitor is designed for IBM PC and other PC compatibles. The high resolution of 900 lines at center provides excellent character definition. Complemented by a non-glare, high contrast screen, the 2015 is easy on the eyes and excellent for extended viewing. The separate ttl input signals are accepted via a 9-pin connector, the standard connection to the IBM monochrome display card.



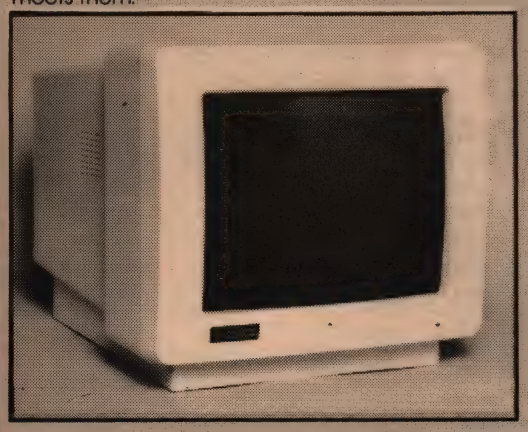
SWIVEL STAND $9.95
Get your Swivel Monitor Stand for 12" Monitors for this Low, Low introductory Price.

GoldStar

RGB COLOR VIDEO MONITORS

Goldstar color video display monitors provide the enhanced performance required of today's personal and business micro computers. High resolution, vivid image displays are suitable for the most demanding applications. The medium resolution display monitor provides sharp, clear characters and graphic elements. These monitors are designed to minimize eyestrain by eliminating glare. Goldstar color monitors are compatible with a wide variety of personal computers and video systems.

Image stability, depth-of-color and picture clarity are the performance objectives. Goldstar meets them.



MCM-4035 NOW $279

List $549

The 13" MCM-4035 delivers superior value. The medium resolution color display creates a very sharp image. Sixteen colors are produced on the anti-glare screen and up to 2,000 characters fit on the display. High reliability combines with high quality image production to make it a flexible, multi-purpose color monitor for most micro computer applications. The 4035 accepts RGB direct drive input, and, the controls are located behind the front panel for both easy access and clean, aesthetic appeal.

MCH-4015 NOW $319

The 13" MCH-4015 delivers the extra sharp, high resolution quality images demanded by presentation graphics. Top-of-the-line performance combines features such as an anti-glare screen and 31-mm dot pitch to provide continuous, easy viewing. It accepts RGB direct drive input, and, the controls are located behind the front panel for both easy access and clean, aesthetic appeal to compliment any work area.

CGA-Compatible Monitors: Summary of Features

Manufacturer	Model	List Price	Screen Size	Dot Pitch	Horiz Freq	Vert Freq
Amdek	Color 600	$599	13	0.43	15.75	60
Amdek	Color 710	$699	13	0.31	15.75	60
IBM Corp.	Color	$680	13	0.43	15.75	60
Princeton Graphics	HX-12	$695	11.5	0.31	15.70	60
Thomson Products	CM36382Si	$529	14	0.38	15.70	60
Wyse Tech.	WY-620	$545	13.5	0.43	15.75	60
Goldstar	MCM-4035	$549	13	0.43	15.75	60
Goldstar	MCH-4015	$659	13	0.31	15.75	60

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Friends:

The latest opportunity for you to increase your office productivity is with the complete line of Seikosha printers. Seikosha's are made with the same precision and durability you have come to expect from the quality leader in the watch industry – Seiko. Seikosha is also the sister company of the largest microcomputer printer manufacturer in the world – Epson. With this great Seikosha heritage and MidWest Micro's dedication to giving you quality equipment at the most competitive pricing, we offer you these three great business quality printers.

The BP-5200I with its fast 200 cps throughput in draft and 103 cps in correspondence mode will speed up almost any small to medium business operation. The BP-5420AI is a super high performance business application printer. It offers great speed at 420 cps, excellent quality output, and rear and bottom paper feed. The BP-5420AI compares across the board with the Epson 420I and even uses the same ribbon cartridge.

Finally, we offer you the best possible value in a high-speed business printer with a low-cost color option. The MP-1300AI is the sister-in-law to the Epson EX-800 but beats it hands down when compared feature for feature. For example, the MP-1300AI prints at 300 cps in draft pica while the EX-800 is only 250 cps, the MP-1300AI offers both rear and bottom paper path with the EX-800 being only rear, and the MP-13000AI gives you a 10k print buffer as opposed to the EX-800 with its 8k print buffer.

Seikosha outperforms the competition where it counts and even has a two full year warranty. Call MidWest today for the solution to your business printer needs.

Sincerely,

Mark L. Runkle
President

SEIKOSHA

There's Quality in Our Name
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Let MidWest Micro improve your office productivity with a reliable Seikosha Business Printer - All backed by a 2 Full Year Warranty.

Reduce the processing time of a large volume of business data to an incredible minimum with . . .

SEIKOSHA 1300AI

2 Full Year Warranty

Only **$389** List $799

- High Speed Printing (300 cps) with Minimum Noise
- Superb NLQ Printing (50 cps)
- 47 lpm Throughput (Draft)
- Variety of Characters and Graphics
- Both IBM and EPSON Compatible Printer Emulation Modes
- Built-in Parallel and Serial Interfaces
- Auto Paper Loading and Ejection
- Downloadable Character Settings
- Front Panel Margin Setting
- Built-in 10k Print Buffer
- Both Rear and Bottom Paper Path
- Easy-to-Handle 7 Color Printing Kit (optional)

SEIKOSHA MP-1300AI BEATS EPSON EX-800 Feature for Feature

- Seikosha has a 2 Full Year Warranty instead of Epson's 1 Year
- MP-1300AI prints at 300 cps in draft pica while EX-800 is only 250 cps
- MP-1300AI has both rear and bottom paper path while the EX-800 has only rear
- MP-1300AI gives you a 10k Buffer as opposed to an 8k on the EX-800

SEIKOSHA MP-1300AI COLOR KIT Lists $155 **ONLY $125**

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SEIKOSHA BP-5200I

Just **$359** List $1049

2 Full Year Warranty

- High Speed Draft Mode at 206 cps
- Correspondence Mode at 103 cps
- Extremely Low Noise Level
- Built Sturdily for Extra Heavy Duty Use
- All IBM PC Characters and Graphic Elements
- 4k Built-in Print Buffer
- Uses Paper up to 15.5" Wide
- Rear and Bottom Paper Path
- Automatic Cut Sheet Feeder Optional

OPTIONAL BP SERIES CUT SHEET FEEDER ONLY $349 List $399

Bring the true value of high speed performance to your office with . . .

SEIKOSHA BP-5420AI

Only **$999** List $1849

2 Full Year Warranty

- 420 cps Maximum Print Speed
- High Quality Correspondence Printing at 104 cps
- IBM and EPSON Mode Selectable
- Built-in 18k Print Buffer
- Both Parallel and Serial Interfaces
- Pin Feed and Friction Feed Standard
- Handles Paper up to 15.5" Wide
- Eight Language Fonts with DIP Switch Selector
- Heavy-Duty Construction
- Automatic Cut Sheet Feeder Optional
- Rear and Bottom Paper Path

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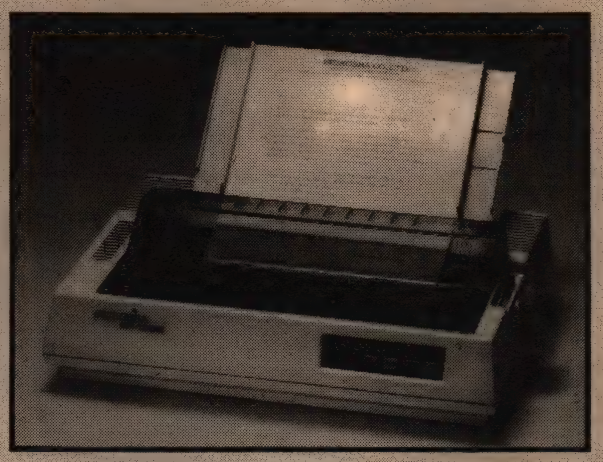
SEIKOSHA SP-1000 PRINTER



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Low As $179

PRINTOUT SAMPLE

```
789:;<=>?@ABCDEF
<=>?@ABCDEFGHIJKLM
789:;<=>?@ABCDEFGHI
/0123456789:;<=>?@ABCDEFGHI
789:;<=>?@ABCDEF
<=>?@ABCDEFGHIJKLM
789:;<=>?@ABCDEFGHI
EFGHIJKL
789:;<=>?@ABCDEFGHIJKLMNOPQ
```

SUGGESTED LIST $349.

In order to keep your loyalty we at MidWest Micro are always looking for more printer and less price. In that search we've found for you a real gem in the price/performance arena. The Seikosha SP-1000 is made with the same precision and durability you have come to expect from the quality leader in the watch industry – Seiko.

The SP-1000 is completely full featured with the latest advances incorporated. It provides excellent near letter quality printing with a dense 24 by 18 dot density. This equates to 41,472 addressable dots per inch and gives superb "typewriter like" printing. Other printers with resolution this high cost hundreds of dollars more.

With the SP-1000 your computer can print 40, 48, 68, 80 or 136 characters per line. It can print 35 separate character styles including 13 double width and 3 reversed styles. You get Pica, Elite, Condensed and Italics – plus true superscripts and subscripts. All this can be done automatically, through easy commands right from your keyboard.

You get all these great features plus much, much more with the SP-1000 and there is a model made to fit your application. (This saves further in interfacing costs and problems). So call today to order or ask for a free brochure and print sample.

SP-1000 Series

	Your Price
• **SP-1000A,** Centronics parallel	$199
• **SP-1000AS,** RS-232 serial version	199
• **SP-1000 I,** IBM® PC compatible	199
• **SP-1000VC,** Commodore® C-64/C-128™ compatible	179
• **SP-1000AP,** Apple® IIC/Macintosh™ compatible	199

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Features

- Impact dot matrix method, bi-directional in logic seeking, undirectional in graphic printing.
- 100 (Draft mode), 20 cps (Near Letter Quality) print speed, with reduced noise level.
- Adjustable tractor and friction feed standard.
- Automatic paper loading function.
- Paper empty detection.
- Input data dump in hexadecimal.
- Right, left margin set function.
- Self test printing.
- A variety of functions including Underline, Bold print, Double striking.
- A variety of print character sets including Pica, Elite, Proportional, Elongated, Condensed, Italics, Super/Subscripts, and Italic Super/Subscripts.
- Automatic printing.
- Epson FX compatibility (A & AS models).
- Quality craftsmanship from the same parent company as Epson Printers and Seiko watches.
- Backed by the best warranty in the business. (2 full years with service centers throughout the U.S.)
- Standard 1.5K buffer.

Character Font			Character Structure (H x V + Space)	Maximum Column Number	Character Spacing (Character/Inch)	Print Speed (Character/Second)
Standard Character	Standard	Pica	*12x9	80	10	100
		Elite	*12x9	96	12	50
		Condensed	*14x9	137	17	70
	Near Letter Quality	Pica	*24x18	80	10	20
		Elite	*12x18	96	12	24
Italic Cursive Character	Standard	Pica	*16x9	80	10	100
		Elite	*16x9	96	12	50
		Condensed	*18x9	137	17	70
	Near Letter Quality	Pica	*32x18	80	10	20
		Elite	*32x18	96	12	24
Graphic	Single Density Graphic		nx8	480 dot column	—	600 dot column
	Double Density Graphic		nx8	960 dot column	—	490 dot column
	Double Speed, Double Density Graphic		nx8	*960 dot column	—	600 dot column
	Quadruple Density Graphic		nx8	*1920 dot column	—	*980 dot column
	640 Dot Graphic		nx8	640 dot column	—	326 dot column
	576 Dot Graphic		nx8	576 dot column	—	294 dot column
	720 Dot Graphic		nx8	720 dot column	—	367 dot column

*Indicates that the specified figure includes half dots.

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Dear Friends,

Why buy an obsolete printer from a no support liquidator when you can have the latest technology and a major brand with full support? Call MidWest Micro for the printer that has it all – Brother M-1509.

With the exciting list of standard features on the M-1509, this printer is an outstanding value. With the 1 full year warranty and the renowned Brother reputation for quality, the M-1509 stands out in the wide carriage business printer market. And don't forget the versatility with the parallel and serial interfaces standard and the ability to add a cut sheet feeder.

It is only fitting that MidWest Micro has won the BEST BUY AWARD in the impact printer catagory with deals such as the Brother M-1509. We are very excited to offer you this exceptional printer but ask that you hurry and call today so you won't be left out.

Call MidWest Micro today for your Brother M-1509 and "Save with Confidence."

Sincerely,
Mark L. Runkle
President

brother M-1509

High Speed Printing
The M-1509 prints out your work at a rapid 180 cps, a speed generally offered only on much more expensive models. Logic-seeking bi-directional printing and a 3 Kbyte input buffer ensure that operation is fast and efficient.

Near Letter Quality Printing
A handsome NLQ character font is provided to handle all your business correspondence needs. One touch of the NLQ button is all it takes. And three other NLQ fonts can be optionally selected.

Graphics Capability
The M-1509 gives you a choice of seven high density bit image modes for graphics. Clean and attractive charts and graphs are printed out at a rapid pace.

Auto Paper Loading
Paper insertion is a simple, automatic operation controlled from the front panel. Paper will be fed to the correct position for printing to begin. The M-1509 can be used for data processing, as well, holding 16 - ½" width cut sheets or 16" width fanfold paper (136-column width).

IBM and Epson Compatibility
The M-1509 is equipped with character sets and control codes compatible with both the IBM PC® printer and the Epson FX-100 +®. This means easy interfacing with the wide range of personal computers that can be used with either of these two printers.

Quiet Operation
An important, but often overlooked, printer feature is the amount of noise it makes. In the case of the M-1509, this is very little – below 58 decibels – so it will never interfere with office routine.

One Inch Paper Cut
After printing stops, the push-up pin tractor feeds paper forward so that printing will begin again one inch after the paper perforation. Unlike many printers, the M-1509 does not feed forward – thereby wasting – the whole of the next page.

Ribbon Replacement
The ribbon will last for more than 2.5 million characters, but when it does need to be replaced, all you do is change cartridges – there's no need to touch the ribbon.

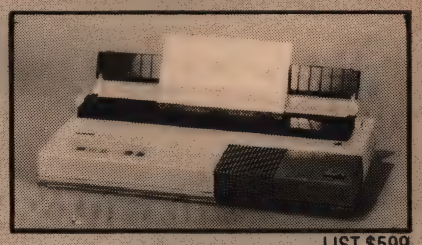
NLQ Font/Buffer Board (Optional)
The LQ-200 font board provides an extra choice of type styles and memory. It adds Analia PS and Gothic plus 16 Kbytes of RAM memory.

Attention Dealers

Let MidWest Micro help you maximize your profits and minimize your inventory costs. Our exciting prices and delivery schedules will improve your bottom line. DEALERS CALL 800-528-4504, In Ohio 800-222-6571.

The Printer That Has It All . . .

brother M-1509



LIST $599

YOUR PRICE Too Low To Advertise**

Brother M-1509 Beats Epson FX-286 Hands Down

- Wide Carriage for up to 15.5" Paper Handling
- Fast 180 cps Print Speed
- Near Letter Quality Printing – 45 cps
- Full Graphics Capability
- Both Centronics Parallel and RS-232 Serial Interfaces
- Both IBM Graphics Printer & Epson FX Emulation
- Easy Access Control Panel
- Durable Construction
- 1 Full Year Warranty
- Large 3k Input Buffer with Optional 16k Upgrade
- Paper Saving Short Form Tear-Off
- Auto Paper Loading
- Quiet Operation (Below 58 db.)

More brother Printer Savings

		Sugg. Retail	Your Price
PRINTERS			
HR-15XL	Parallel or Serial, 17 cps	$599	**$299**
HR-20	Parallel & Serial, 22 cps	499	~~399~~
HR-35	Parallel or Serial, 36 cps	995	**749**
Twinriter 5	Daisy (36 cps) & Dot (140 cps)	1295	**CALL**
M-1509	180 cps, Parallel & Serial, NLQ	599	**CALL**
M-1709	240 cps, NLQ, 24K Buffer	699	**CALL**
PRINTER ACCESSORIES			
TF-50	HR-15XL Tractor Feed	$139	**$ 99**
TF-100	HR-25/35 Tractor Feed (Also Fits Datasouth DW-36 & Comrex CR-4)	149	**119**
TF-300	Twinriter 5 Tractor Feed	149	**129**
CF-50	HR-15XL Cut Sheet Feeder	259	**199**
CF-100	HR-25/35 Cut Sheet Feeder	269	**129**
CF-300	Twinriter 5 Cut Sheet Feeder	299	**259**
SF-40	M-1509 Cut Sheet Feeder	149	**129**
KB-50	HR-15XL Typewriter Keyboard	199	**169**
IF-232	Twinriter 5 Serial Port	59	**49**
LQ-200	M-1509 Font & Buffer Board	99	**79**
Wheel	HR-10/15XL/25/35 Cassette Printwheel	25	**23**
KB-150	Typewriter Keyboard For Diablo Comp. Parallel Printers	299	**CALL**

PRINTER RIBBONS
Brother Cartridge Ribbons — Low as **$2.79** each
(Multistrike Film, One-Time Film, Nylon Fabric, Correctable Film, Red Tape, Correction Tape, Twinriter 5 Multistrike & Fabric)

**Special Note

As you know, whenever possible MidWest Micro publishes unbelievably low prices. However, on this model your savings are so great that our publishing the price might interfere with other marketing channels. Please call today. I guarantee you will be delighted.

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For your protection we check thoroughly for stolen credit cards.

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135 S. Springfield St., Saint Paris, Ohio 43072

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All equipment shipped factory fresh with manufacturers warranty

HIGH TECHNOLOGY — NOT HIGH PRICES

Best Business Printer Buys In U.S.

420 CPS COMREX CR-420 Business Printer MOVES MOUNTAINS

MidWest Micro-Peripherals
135 South Springfield Street Saint Paris, Ohio 43072
Phone (513) 663-5488

Friends,

MidWest Micro has landed for you two of the best continuous duty, business quality printers anywhere. And the values absolutely cannot be beat! Through special arrangements we are able to offer a limited quantity of Comrex CR-4 daisywheel and CR-420 high speed dot matrix printers at unbelievable savings.

These printers are new in factory containers and come to you complete with manufacturers warranty.

Again this is a limited offer and will not be repeated. So call now and "Save with Confidence" to the tune of several hundreds of dollars.

We at MidWest Micro will continue to do our best for you. Thank you for your generous patronage.

Sincerely,

Mark L. Runkle
President

P.S. Don't forget MidWest Micro has the fastest delivery and best after-the-sale support in the business. Call today!

COMPUTER SHOPPER Best Buy OF THE YEAR

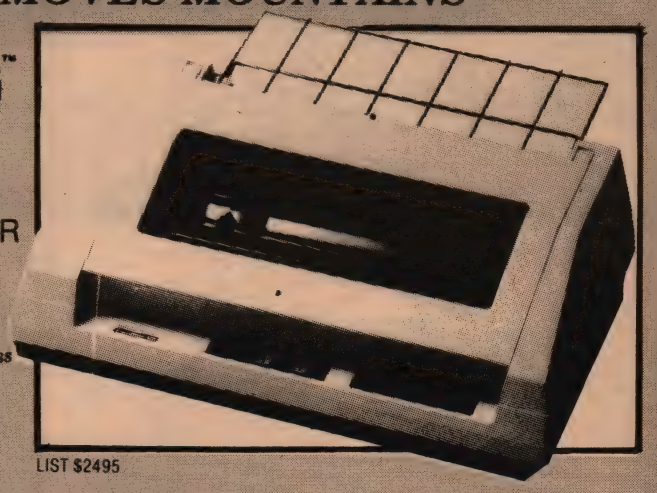
MidWest Micro
Winner of Computer Shopper's Best Buy Award for Impact Printer

COMREX™

CR-420
NOW WITH IBM PRINTER EMULATION!

$~~659~~ *Even Less*

We will match any advertised price! (We offer Immediate Shipping and Full Support.)



LIST $2495

This stupendous brute of a printer will make short work of even your largest spreadsheets and reports. You will surprise yourself and amaze your friends and colleagues with this super printer performing in your office. Don't miss out on this one!

CR-420 Ribbon Cartridges $16.95 each
Call for Quantity Savings

SPECIFICATIONS

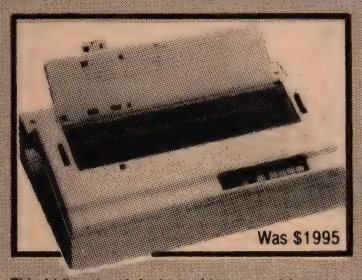
Carriage Width: 132 Columns (at 10 pitch)
Print Method: Impact dot matrix, bidirectional, logic seeking in both text and graphics
Print Speed: 420 CPS/Draft; 104 CPS/Correspondence Quality; 2500 dots/sec. – standard graphics; 1250 dots/sec – high-density graphics
Print Head: 8-pin, staggered arrangement
Character Sets: Standard 96 ASCII printing in 17 fonts
Line Spacing: n/180 (n=0-255)
Paper Feed: Pin feed (paper width adjustable) and built-in friction feed
Paper Width: 5" to 15" (pin feed); Up to 16" (feed)
Paper Path: Rear and bottom entry
Paper Thickness: Original plus 4 copies (5-part)
Ribbon: Cassette style, single color (black)
Interfaces: Parallel – Centronics-style; and Serial –RS232C Asynchronous
Baud Rate: 1200, 2400, 4800, 9600; switch selectable
Protocols: X-ON/X-OFF, READY/BUSY, ETX/ACK, switch selectable
Buffer: 18K
Reliability: MTBF – 800 hours continuous printing; MCBF – 200 million characters; MTTR – 30 minutes
Power: 117 VAC ± 10%, or, 220 VAC ± 10%, 50/60 H_z
Power Consumption: 55W (Standby); 175W (Operating at self test print); 250W (Operating at heaviest duty)
Environmental Limits: Temperature (operating) 5°-40°C; 40°-105°F; Humidity (operating) 20-80%
Dimensions: 595mm (W) x 194mm (H) x 405mm (D); 23.4" (W) x 7.6" (H) x 15.9" (D)
Weight: 27kg; 60 lbs.

CR 420 Ribbon Cartridges $16.95 each BUY 12+ at $13.45 each

36 CPS DAISYWHEEL PRINTER...

Mechanically identical to the Brother HR-35

- **Superior Performance**
- **Fast 36 CPS Print Speed**
- **7K Print Buffer**
- **Continuous Duty Cycle**
- **Wide 16.5" Paper Carriage**



Was $1995

Your Price Just

$399

2+ $369
3+ $349

This bidirectional, logic seeking marvel lets you adjust the hammer intensity to print anything from single-page letters to five-part forms with equal clarity. A variety of impressive typestyles give you added print versatility.

It is exceptional in many other ways. The 15½" wide carriage briskly prints all your ledgers, spreadsheets, and extra wide business graphics with ease. With the optional cut sheet feeder and tractor feeder, you can print several copies on your letterhead and switch to pin-fed paper for high volume word or data processing.

The 7K buffer holds a substantial amount of data while its printing.

The average life of the print wheel is 10 million characters. Which means that you can run it eight hours a day — every day of the week — for almost two full years. Of course, under more normal usage, it will handle your business correspondence and graphics for up to five full years without service. That's impressive.

Quiet quality.
What your eyes don't tell you, your ears will. Because this printer is much quieter than many more expensive printers. So you can keep the noise down while you keep the cost down.

Specifications

Print Speed	36 CPS (Shannon text)
Print Wheel	96 petals/wheel, cassette type, ASCII stand.
Print Wheel Life	10 million char./wheel
Characters/Line	132 characters (1/10"), 158 characters (1/2"), 198 characters (1/15")
Paper Width	16.5 in max (419 mm)
Copy Capacity	Original (45 kg) + 4 copies (15 kg) (total thickness 0.35 mm max.)
Carriage Motion	Bidirectional, logic seeking
Carriage Rtrn Speed	750 ms (at 13.2" return)
Line Spacing	6, 4, 3 lines/inch, 1/48" proportional increments
Paper Feed	Bidirectional, logic seeking
Paper Feed Speed	4"/second
Available Ribbons	

	Ribbon Life
Single-strike black carbon film	60,000
Multi-strike black carbon film	150,000
Single-strike black correctable film	70,000
Multi-strike black fabric	500,000
Single-strike red film	2,000
Correction tape	1,500

Interface	Standard RS-232C – Serial
Buffer Size	7K
Control Panel	Indicators: Select, Power, Alarm, Line, Pitch, and Copy (LEDs) Switches: Select, Line Feed, TOF, Line, Pitch, and Copy
Noise	Operating – Less than 65 dB
Temperature	50 to 105 F – 10 to 40 C (operating)
Humidity	20% to 80% non-condensing (operating) 5% to 90% non-condensing (storage)
Power	120 V, 60 Hz (Optional: 120 or 220 - 240 V, 50/60 Hz) 130 W Max.
Dimensions	21.18 (W) x 7.65 (H) x 15.15 (D) inches (538(W) x 194.5 (H) x 385 (D) mm)
Weight	33 lbs (15 kg)
Optional Features	Tractor feeder, Auto Cut Sheet Feeder, Single and Multi-strike ribbons, Interchangeable printwheels (Numerous languages and typestyles)

RIBBON CARTRIDGES ..... As Low As $2.79 each
FORMS TRACTOR (Fits CR-4, Datasouth DW-36, Brother HR-25/35) ..... $119 each
AUTO CUT SHEET FEEDER (Fits CR-4, Datasouth DW-36, Brother HR-25/35) ..... $129 each

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All equipment shipped factory fresh with manufacturers warranty

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DISKETTES & ACCESSORIES Page ONE

SONY®

BOXED IN TENS

	50+	100+
3½'' SS	**1.17**	**1.14**
3½'' DS	**1.68**	**1.65**
5¼'' DS/DD	**.99**	**.95**
5¼'' HD	**1.99**	**1.89**

SONY® MAC•PAC

PACKAGED IN FIFTIES

	100+	400+
3½'' SS	**1.07**	**1.02**
3½'' DS	**1.39**	**1.32**

LABELS AVAILABLE!

MEMOREX Computer Supplies

5¼'' DS/DD•Boxed in tens

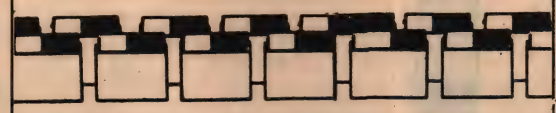
79¢ EACH QTY. 300

85¢ Each, Qty. 100

Nashua®

- ☐ Boxed in tens
- ☐ Envelopes, labels and write protects
- ☐ 100% certified

	50+	100+
3½'' SS	**1.17**	**1.09**
3½'' DS	**1.59**	**1.49**
5¼'' SS/DD	—	**.57**
5¼'' DS/DD	—	**.59**
5¼'' HD	**1.65**	**1.59**



- ☐ Packaged in poly-bags of 50, sold in increments of 250.
- ☐ Labels, write protects & envelopes

5¼'' SS/DD **39¢** each 500+ — 41¢ each, 250+

5¼'' DS/DD **41¢** each 500+ — 45¢ each, 250+

VERIFLEX

5¼'' DS/DD Disks 100% Error Free

BULK AS LOW AS **28¢** each, 1000+

- ☐ Bulk wrapped in tens
- ☐ With envelopes, labels, and write protects

33¢ ea., 500+
37¢ ea., 100+

WHITE BOX AS LOW AS **37¢** each, 1000+

- ☐ Boxed in tens
- ☐ With envelopes, labels, and write protects

39¢ ea., 500+
41¢ ea., 100+

WHITE BOX HD

99¢ each, 1000+

- ☐ Boxed in tens
- ☐ Envelopes, write protects & labels

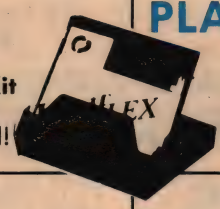
1.09 ea., 500+
1.15 ea., 100+

wabasti DATATECH

BOXED IN TENS

	50+	100+
3½'' SS	**1.04**	**.99**
3½'' DS	**1.35**	**1.29**
5¼'' DS/DD	**.54**	**.49**

FREE!
Wilson Jones CRT Cleaning Kit
With every $100 of Wabash 5¼'' disks ordered from this ad!



PLASTIC CASE AS LOW AS **62¢** each, 100+

67¢ ea., 50+

- ☐ Boxed in tens in durable plastic case
- ☐ Envelopes, write protects and labels

ROLLTOPS/FLIPSORTS

GENUINE TEAK
Holds 50 3½'' . . . **17.49**
Holds 50 5¼'' . . . **24.99**
Holds 100 5¼'' . . **32.99**

CLASSIC DESIGN
In Buff'N Oak
3½'' Model **17.49**
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Flip'n File
Holds 50 5¼'' . **8.39**

DataCase
Holds 50 5¼'' . **5.99**

3M 5¼'' DS/DD DISKETTES

85¢ Each Qty. 500+

88¢ each, Qty. 100+

A-B SWITCH

2 port, parallel	**24.99**
2 port, serial	**22.99**
4 port, parallel	**39.99**
4 port, serial	**34.99**

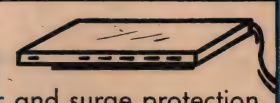
SURGE SUPPRESSORS

*For **CLEAN** Power*

- ☐ Normal and common mode suppression
- ☐ Low let-thru voltage

$8.99

SYSTEM PROTECTOR



Master control center and surge protection

- ☐ Upfront, individual switches for up to five devices
- ☐ Master switch
- ☐ LED indicators
- ☐ Static protection
- ☐ Swivel base
- ☐ 6' base cord

COMPARE AT...
$49.95

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*If you prefer sending in your order, please call first for shipping/handling charges.
*All prices/specifications subject to change without notice.

ORDERING INFORMATION

TERMS: Shipping/handling additional. Minimum order $100. Visa, Mastercard and Prepaid orders accepted. Corporations rated 3A2 or better and government accounts are accepted on a net 30 basis. C.O.D. orders add an additional $5.00 special handling charge. APO, FPO, AK, HI & PR orders add an additional 5% to the total order amount to cover PAL and insurance. No sales tax outside of IL. All other countries add 20%.

Page TWO SUPPLIES AND ACCESSORIES Featuring 3M Data Cartridges at LOW Prices!

PC TOOL KIT
MICROCOMPUTER ACCESSORIES

- Reversible T-10/ T-15 Torx driver
- Integrated circuit inserter/extractor
- 5'' long 3-prong parts retriever/extractor

AND MUCH MORE!
$29.99 VALUE

$21.99

TILT'N TURN
Fits large monitors

$24.99

CPU STAND
•Saves desk space

$32.99

CRT VALET
MICROCOMPUTER ACCESSORIES

$98 *COMPARE!*

LOW COST ARM SAVE DESKTOP SPACE

- ☐ Holds monitors up to 75 lbs.
- ☐ Base rotates 360°
- ☐ Platform swivels 180°
- ☐ Wall, desk or flange mount
- ☐ Flexible tube inside arm hides cable and prevents tangles

Order your 3M data cartridges from USA ★ FLEX, and save!

DC100A	**20.67**
DC300XL	**18.37**
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DC100A	**11.77**
DC300A	**15.43**
DC600XTD	**21.98**
DC615HC	**17.17**
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All cartridges boxed in fives

SPECIAL!
3M data cartridge desktop storage unit holds 10 cartridges

ONLY **99¢** with every 10 cartridges you order from this ad!

A $24.99 value
Quantities Limited

SHAPE
20 Meg cassettes for Genoa and Memtec tape back-up systems.

$9.95 EACH

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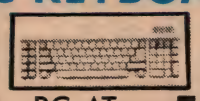


5050—PC AT . . . **57.59**

5339—with separate cursor pad **75.49**

SOFTWARE

CLOSEOUT: Lotus 123 VERSION 1A

The original ''preferred version''

$239 Limited Quantities

BPS GRAPHICS . . $14
Now get this powerful graphics package with every Epson printer you order. See page 3 of our ad section!

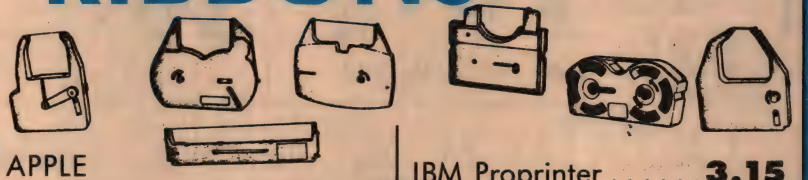
PEACHTEXT **$39**
MULTIPLAN **$39**

COPY II PC OPTION BOARD
FROM: Central Point Software

$83

- ☐ Add-in board
- ☐ Includes track editor
- ☐ Uses one full size slot
- ☐ Makes archival back-ups of protected software
- ☐ Gives you same capabilities as most disk duplicators

RIBBONS *SOLD IN SIXES*



APPLE
- Imagewriter **2.29**
- Color 6-Packs **3.05**
  (Incl. one each: red, yellow, green, blue, brown, purple)

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- M200 . . . . . **4.29**

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- LQ-800 . . . . . **2.99**
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- LQ-2500 . . . . . **18.59**
- MX-100 . . . . . **2.99**
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- FX-85 . . . . . **2.25**
- JX-80 . . . . . **2.25**

- IBM Proprinter **3.15**

NEC
- Spinwriter **4.79**

NCR 2140 Answer
- Cassette **2.99**

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- 80/82/83/92/93 . . . **1.25**
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- TOSHIBA 1350 . . . . . **3.59**

WANG
- System 5 . . . . . **2.29**

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FREE OFFER! **PRINTERS Save on EPSON!** FREE OFFER! Page THREE

FREE

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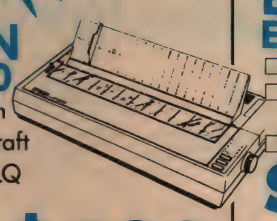
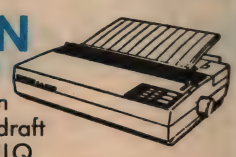
EPSON LQ-1000



- ☐ 136 column
- ☐ 180 CPS-draft 60 CPS-NLQ
- ☐ 24-pin

$682

EPSON EX-800



- ☐ 80 column
- ☐ 300 CPS-draft 60 CPS-NLQ
- ☐ 8K internal buffer

$444

User-installable color kit . . $75

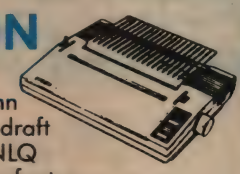
EPSON FX-86e

NEW

- ☐ 136 column
- ☐ 240 CPS-draft 40 CPS-NLQ
- ☐ 8K buffer

$376 *Replaces FX-85*

EPSON LX-86

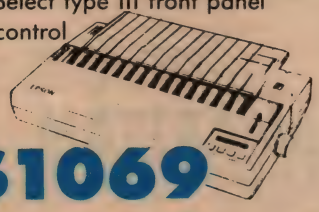


- ☐ 80 column
- ☐ 120 CPS-draft 16 CPS-NLQ
- ☐ SelecType feature
- ☐ Built-in print codes with IBM-style graphics characters

$205

EPSON LQ-2500

- ☐ 136 column
- ☐ 324 CPS-draft 108 CPS-LQ
- ☐ Five resident fonts
- ☐ Select type III front panel control



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User-installable color kit . . $95

EPSON FX-286e

NEW

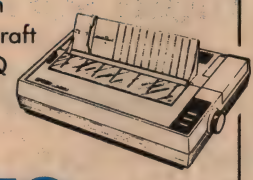
- ☐ 136 column
- ☐ 240 CPS-draft 48 CPS-NLQ
- ☐ 8K buffer
- ☐ Tractor standard

Replaces FX-286

$536

EPSON LQ-800

- ☐ 80 column
- ☐ 180 CPS-draft 60 CPS-LQ
- ☐ 24-pin
- ☐ 7K buffer



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- ☐ 640K memory
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- ☐ 6 pages per minute

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Transceive through almost ANY ordinary telephone receiver

90 Day Warranty!

Liquidation—Limited quantities

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- ☐ Fast and quiet (22 CPS at 58 dB)
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- ☐ Sheet and tractor feed available

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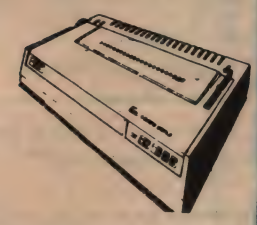

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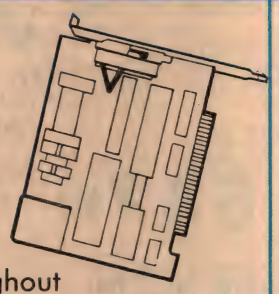
Page FOUR MODEMS / ADD-ONS

Featuring a 2400 BPS external modem for under $200!

USA ★ FLEX'S HAYES COMPATIBLE 2400 BPS EXTERNAL MODEM PUTS AUTO-DIAL, AUTO—ANSWER AT YOUR FINGERTIPS FOR UNDER $200!!

"smalltalk"
Half Card Modem



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- ☐ Easy to install
- ☐ 18 number dialing table
- ☐ Single keystroke commands throughout
- ☐ Auto-dial to Dow Jones and the Source

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"desktalk"
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SATISFACTION GUARANTEED!

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- ☐ HELP screen
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INCOMM
TURBO 2400 BAUD EXTERNAL MODEM

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- ☐ Speed upgradeable
- ☐ Auto-Dial/Auto-Answer
- ☐ HELP screen

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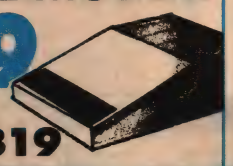

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Communications Software

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(includes controller card)

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EQUIPMENT BEST BUYS... BEST PERFORMERS. FIVE Page

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COMPLETE SYSTEM:

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- ☐ 135 watt power supply
- ☐ Two Fujitsu 5¼" floppy drives
- ☐ 4.7/8 MHz keyboard selectable
- ☐ Intel 8088 microprocessor
- ☐ Manual, DOS

$649

With Samsung TTL monochrome monitor, tilt'n swivel base, and Hercules type video board

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Page SIX LIQUIDATIONS

Look over this page for deals you can't find anywhere else!

Just a quick note to let you know about our new "feature liquidations". More and more often, we're offered "liquidation buy-outs" of software, supplies & equipment ...these are all brand new, top-quality products—

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- ★ ONE YEAR WARRANTY

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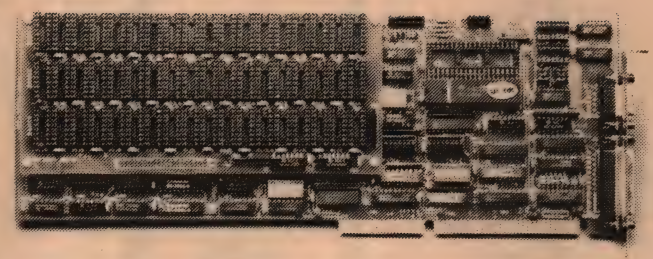

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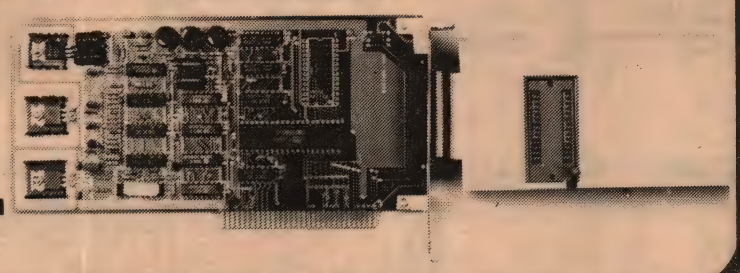

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2112	256x4	(450ns)	2.99
2114	1024x4	(450ns)	.99
2114L-4	1024x4	(450ns)(LP)	1.09
2114L-2	1024x4	(200ns)(LP)	1.49
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HM6116LP-4	2048x8	(200ns)(CMOS)(LP)	1.95
HM6116LP-3	2048x8	(150ns)(CMOS)(LP)	2.05
HM6116LP-2	2048x8	(120ns)(CMOS)(LP)	2.95
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4116-200	16384x1	(200ns)	.89
4116-150	16384x1	(150ns)	.99
4116-120	16384x1	(120ns)	1.49
MK4332	32768x1	(200ns)	6.95
4164-200	65536x1	(200ns)(5v)	1.19
4164-150	65536x1	(150ns)(5v)	1.29
4164-120	65536x1	(120ns)(5v)	1.95
MCM6665	65536x1	(200ns)(5v)	1.95
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41128-150	131072x1	(150ns)(5v)	5.95
TMS4464-15	65536x4	(150ns)(5v)	6.95
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5v=Single 5 Volt Supply REFRESH=Pin 1 Refresh

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2732	4096x8	(450ns)(5V)	3.95
2732A	4096x8	(250ns)(5V)(21V PGM)	3.95
2732A-2	4096x8	(200ns)(5V)(21V PGM)	4.25
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2764-250	8192x8	(250ns)(5V)	3.95
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5V=Single 5 Volt Supply 21V PGM=Program at 21 Volts

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Model	Timer	Capacity Chip	Intensity (uW. Cm²)	Unit Price
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PE-14T	YES	9	8,000	$119.00
PE-24T	YES	12	9,600	$175.00

8000

8035	1.49
8039	1.95
8080	2.95
8085	2.49
8087-2	169.95
8087	129.00
8088	6.95
8088-2	9.95
8155	2.49
8155-2	3.95
8748	7.95
8755	14.95
80286	129.95
80287	199.95

8200

8203	24.95
8205	3.29
8212	1.49
8216	1.49
8224	2.25
8237	4.95
8237-5	5.49
8250	6.95
8251	1.69
8251A	1.89
8253	1.89
8253-5	1.95
8255	1.69
8255-5	1.89
8259	1.95
8259-5	2.29
8272	4.95
8279	2.49
8279-5	2.95
8282	3.95
8284	2.95
8286	3.95
8288	4.95

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Z80-CPU 2.5 MHz 1.69

4.0 MHz

Z80A-CPU	1.79
Z80A-CTC	1.89
Z80A-DART	5.95
Z80A-DMA	5.95
Z80A-PIO	1.89
Z80A-SIO/0	5.95
Z80A-SIO/1	5.95
Z80A-SIO/2	5.95

6.0 MHz

Z80B-CPU	3.75
Z80B-CTC	4.25
Z80B-PIO	4.25
Z80B-DART	14.95
Z80B-SIO/0	12.95
Z80B-SIO/2	12.95
Z8671 ZILOG	19.95

6500

1.0 MHz

6502	2.69
65C02 (CMOS)	12.95
6507	9.95
6520	1.95
6522	4.95
6526	26.95
6532	6.95
6545	6.95
6551	5.95
6561	19.95
6581	34.95

2.0 MHz

6502A	2.95
6520A	2.95
6522A	5.95
6532A	11.95
6545A	7.95
6551A	6.95

3.0 MHz

6502B	6.95

6800

1.0 MHz

6800	1.95
6802	4.95
6803	9.95
6809	5.95
6809E	5.95
6810	1.95
6820	2.95
6821	1.95
6840	6.95
6843	19.95
6844	12.95
6845	4.95
6847	11.95
6850	1.95
6883	22.95

2.0 MHz

68B00	4.95
68B02	5.95
68B09E	6.95
68B09	6.95
68B21	3.95
68B45	6.95
68B50	2.95
68B54	7.95

CLOCK CIRCUITS

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MM58174	11.95
MSM5832	2.95

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68B45	8.95
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CRT5037	9.95
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1791	9.95
1793	9.95
1795	12.95
1797	12.95
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2793	19.95
2797	29.95
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INS8250	6.95

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2.097152	1.95
2.4576	1.95
3.2768	1.95
3.579545	1.95
4.0	1.95
4.032	1.95
5.0	1.95
5.0688	1.95
6.0	1.95
6.144	1.95
6.5536	1.95
8.0	1.95
10.0	1.95
10.738635	1.95
12.0	1.95
14.31818	1.95
15.0	1.95
16.0	1.95
17.430	1.95
18.0	1.95
18.432	1.95
20.0	1.95
22.1184	1.95
24.0	1.95
32.0	1.95

CRYSTAL OSCILLATORS

1.0MHz	5.95
1.8432	5.95
2.0	5.95
2.4576	5.95
2.5	4.95
4.0	4.95
5.0688	4.95
6.0	4.95
6.144	4.95
8.0	4.95
10.0	4.95
12.0	4.95
12.480	4.95
15.0	4.95
16.0	4.95
18.432	4.95
20.0	4.95
24.0	4.95

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74LS00

74LS00	.16	74LS165	.65
74LS01	.18	74LS166	.95
74LS02	.17	74LS169	.95
74LS03	.18	74LS173	.49
74LS04	.16	74LS174	.39
74LS05	.18	74LS175	.39
74LS08	.18	74LS191	.49
74LS09	.18	74LS192	.69
74LS10	.16	74LS193	.69
74LS11	.22	74LS194	.69
74LS12	.22	74LS195	.69
74LS13	.26	74LS196	.59
74LS14	.39	74LS197	.59
74LS15	.26	74LS221	.59
74LS20	.17	74LS240	.69
74LS21	.22	74LS241	.69
74LS22	.22	74LS242	.69
74LS27	.23	74LS243	.69
74LS28	.26	74LS244	.69
74LS30	.17	74LS245	.79
74LS32	.18	74LS251	.49
74LS33	.28	74LS253	.49
74LS37	.26	74LS256	1.79
74LS38	.26	74LS257	.39
74LS42	.39	74LS258	.49
74LS47	.75	74LS259	1.29
74LS48	.85	74LS260	.49
74LS51	.17	74LS266	.39
74LS73	.29	74LS273	.79
74LS74	.24	74LS279	.39
74LS75	.29	74LS280	1.98
74LS76	.29	74LS283	.59
74LS83	.49	74LS290	.89
74LS85	.49	74LS293	.89
74LS86	.22	74LS299	1.49
74LS90	.39	74LS322	3.95
74LS92	.49	74LS323	2.49
74LS93	.39	74LS364	1.95
74LS95	.49	74LS365	.39
74LS107	.34	74LS367	.39
74LS109	.36	74LS368	.39
74LS112	.29	74LS373	.79
74LS122	.45	74LS374	.79
74LS123	.49	74LS375	.95
74LS124	2.75	74LS377	.79
74LS125	.39	74LS378	1.18
74LS126	.39	74LS390	1.19
74LS132	.39	74LS393	.79
74LS133	.49	74LS541	1.49
74LS136	.39	74LS624	1.95
74LS138	.39	74LS640	.99
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74LS145	.99	74LS669	1.29
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74LS151	.39	74LS683	3.20
74LS153	.39	74LS684	3.20
74LS154	1.49	74LS688	2.40
74LS155	.59	74LS783	22.95
74LS156	.49	81LS95	1.49
74LS157	.35	81LS96	1.49
74LS158	.29	81LS97	1.49
74LS160	.29	81LS98	1.49
74LS161	.39	25LS2521	2.80
74LS162	.49	25LS2569	2.80
74LS163	.39	26LS31	1.95
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74HC08	.59	74HC157	.89
74HC10	.59	74HC158	.95
74HC14	.79	74HC163	1.15
74HC20	.59	74HC175	.99
74HC27	.59	74HC240	1.89
74HC30	.59	74HC244	1.89
74HC32	.69	74HC245	1.89
74HC51	.59	74HC257	.85
74HC74	.75	74HC259	1.39
74HC85	1.35	74HC273	1.89
74HC86	.69	74HC299	4.99
74HC93	1.19	74HC368	.99
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74HC109	.79	74HC374	2.29
74HC112	.79	74HC390	1.39
74HC125	1.19	74HC393	1.39
74HC132	1.19	74HC4017	1.99
74HC133	.69	74HC4020	1.39
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74HCT04	.69	74HCT193	1.39
74HCT08	.69	74HCT194	1.19
74HCT10	.69	74HCT240	2.19
74HCT11	.69	74HCT241	2.19
74HCT27	.69	74HCT244	2.19
74HCT30	.69	74HCT245	2.19
74HCT32	.79	74HCT257	.99
74HCT74	.85	74HCT259	1.59
74HCT75	.95	74HCT273	2.09
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74HCT139	1.15	74HCT373	2.49
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74HCT157	.99	74HCT393	1.59
74HCT158	.99	74HCT4017	2.19
74HCT161	1.29	74HCT4040	1.59
74HCT164	1.39	74HCT4060	1.49

74F00

74F00	.69	74F74	.79	74F251	1.69
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74F04	.79	74F138	1.69	74F257	1.69
74F08	.69	74F139	1.69	74F280	1.79
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4017	.49	4522	.79
4018	.69	4526	.79
4020	.59	4527	1.95
4021	.69	4528	.79
4024	.49	4529	2.95
4025	.25	4532	1.95
4027	.39	4538	.95
4028	.65	4541	1.29
4035	.69	4553	5.79
4040	.69	4585	.75
4041	.75	4702	12.95
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4043	.85	74C14	.59
4044	.69	74C74	.59
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4047	.69	74C95	.99
4049	.29	74C150	5.75
4050	.29	74C151	2.25
4051	.69	74C161	.99
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4053	.69	74C164	1.39
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4060	.69	74C193	1.49
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4069	.19	74C240	1.89
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4077	.29	74C374	1.99
4081	.22	74C905	10.95
4085	.79	74C911	8.95
4086	.89	74C917	12.95
4093	.49	74C922	4.49
4094	2.49	74C923	4.95
14411	9.95	74C926	7.95
14412	6.95	80C97	.95

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7400	.19	74147	2.49
7402	.19	74148	1.20
7404	.19	74150	1.35
7406	.29	74151	.55
7407	.29	74153	.55
7408	.24	74154	1.49
7410	.19	74155	.75
7411	.25	74157	.55
7414	.49	74159	1.65
7416	.25	74161	.69
7417	.25	74163	.69
7420	.19	74164	.85
7423	.29	74165	.85
7430	.19	74166	1.00
7432	.29	74175	.89
7438	.29	74177	.75
7442	.49	74178	1.15
7445	.69	74181	2.25
7447	.89	74182	.75
7470	.35	74184	2.00
7473	.34	74191	1.15
7474	.33	74192	.79
7475	.45	74194	.85
7476	.35	74196	.79
7483	.50	74197	.75
7485	.59	74199	1.35
7486	.35	74221	1.35
7489	2.15	74246	1.35
7490	.39	74247	1.25
7492	.50	74248	1.85
7493	.35	74249	1.95
7495	.55	74251	.75
7497	2.75	74265	1.35
74100	2.29	74273	1.95
74121	.29	74278	3.11
74123	.49	74367	.65
74125	.45	74368	.65
74141	.65	9368	3.95
74143	5.95	9602	1.50
74144	2.95	9637	2.95
74145	.60	96S02	1.95

74S00

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74S05	.29	74S188	1.95
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74S85	.95	74S257	.79
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TO-220 CASE

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7808T	.49	7908T	.59
7812T	.49	7912T	.59
7815T	.49	7915T	.59

TO-3 CASE

7805K	1.59	7905K	1.69
7812K	1.39	7912K	1.49

TO-93 CASE

78L05	.49	79L05	.69
78L12	.49	79L12	1.49

OTHER VOLTAGE REGS

LM323K	5V 3A TO-3		4.79
LM338K	Adj. 5A TO-3		6.95
78H12K	12V 5A TO-3		8.95

LINEAR

TL066	.99	LM733	.98
TL071	.69	LM741	.29
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TL074	1.95	LM748	.59
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TL082	.99	MC1350	1.19
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LM319	1.25	ULN2003	.79
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LM386	.89	LM3914	2.39
LM393	.45	MC4024	3.49
LM394H	5.95	MC4044	3.99
TL494	4.20	RC4136	1.25
TL497	3.25	RC4558	.69
NE555	.29	LM13600	1.49
NE556	.49	75107	1.49
NE558	1.29	75110	1.95
NE564	1.95	75150	1.95
LM565	.95	75154	1.95
LM566	1.49	75188	1.25
LM567	.79	75189	1.25
NE570	2.95	75451	.39
NE590	2.50	75452	.39
NE592	.98	75453	.39
LM710	.75	75477	1.29
LM723	.49	75492	.79

H=TO-5 CAN, K=TO-3, T=TO-220

IC SOCKETS

	1-99	100+
8 PIN ST	.11	.10
14 PIN ST	.11	.09
16 PIN ST	.12	.10
18 PIN ST	.15	.13
20 PIN ST	.18	.15
22 PIN ST	.15	.12
24 PIN ST	.20	.15
28 PIN ST	.22	.16
40 PIN ST	.30	.22
64 PIN ST	1.95	1.49
ST=SOLDERTAIL		
8 PIN WW	.59	.69
14 PIN WW	.69	.52
16 PIN WW	.69	.58
18 PIN WW	.99	.90
20 PIN WW	1.09	.98
22 PIN WW	1.39	1.28
24 PIN WW	1.49	1.35
28 PIN WW	1.69	1.49
40 PIN WW	1.99	1.80
WW=WIREWRAP		
16 PIN ZIF	4.95	CALL
24 PIN ZIF	5.95	CALL
28 PIN ZIF	6.95	CALL
40 PIN ZIF	9.95	CALL
ZIF=TEXTOOL		
(ZERO INSERTION FORCE)		

DATA ACQ INTERFACE

ADC0800	15.55	8T26	1.29
ADC0804	3.49	8T28	1.29
ADC0809	4.49	8T95	.89
ADC0816	14.95	8T96	.89
ADC0817	9.95	8T97	.59
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DAC0806	1.95	DP8304	2.29
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DAC1020	8.25	DS8835	1.99
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MC1408L8	2.95	DS8837	1.65

EDGECARD CONNECTORS

100 PIN	ST	S-100	.125	3.95
100 PIN	WW	S-100	.125	4.95
62 PIN	ST	IBM PC	.100	1.95
50 PIN	ST	APPLE	.100	2.95
44 PIN	ST	STD	.156	1.95
44 PIN	WW	STD	.156	4.95

36 PIN CENTRONICS

MALE		
IDCEN36	RIBBON CABLE	6.95
CEN36	SOLDER CUP	4.95
FEMALE		
IDCEN36/F	RIBBON CABLE	7.95
CEN36PC	RT ANGLE PC MOUNT	4.95

INTERSIL

ICL7106	9.95
ICL7107	12.95
ICL7660	2.95
ICL8038	4.95
ICM7207A	5.95
ICM7208	15.95

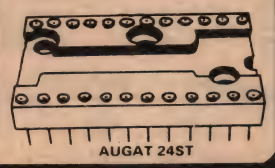
DIP CONNECTORS

DESCRIPTION	ORDER BY	CONTACTS 8	14	16	18	20	22	24	28	40
HIGH RELIABILITY TOOLED ST IC SOCKETS	AUGATxxST	.62	.79	.89	1.09	1.29	1.39	1.49	1.69	2.49
HIGH RELIABILITY TOOLED WW IC SOCKETS	AUGATxxWW	1.30	1.80	2.10	2.40	2.50	2.90	3.15	3.70	5.40
COMPONENT CARRIES (DIP HEADERS)	ICCxx	.49	.59	.69	.99	.99	.99	.99	1.09	1.49
RIBBON CABLE DIP PLUGS (IDC)	IDPxx	---	.95	.95	---	---	---	1.75	---	2.95

FOR ORDERING INSTRUCTIONS SEE D-SUBMINIATURE BELOW

ICC16

IDP14


AUGAT 24ST

D-SUBMINIATURE

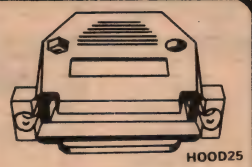
DESCRIPTION		ORDER BY	CONTACTS 9	15	19	25	37	50
SOLDER CUP	MALE	DBxxP	.82	.90	1.25	1.25	1.80	3.48
	FEMALE	DBxxS	.95	1.15	1.50	1.50	2.35	4.32
RIGHT ANGLE PC SOLDER	MALE	DBxxPR	1.20	1.49	---	1.95	2.65	---
	FEMALE	DBxxSR	1.25	1.55	---	2.00	2.79	---
WIRE WRAP	MALE	DBxxPWW	1.69	2.56	---	3.89	5.60	---
	FEMALE	DBxxSWW	2.76	4.27	---	6.84	9.95	---
IDC RIBBON CABLE	MALE	IDBxxP	2.70	2.95	---	3.98	5.70	---
	FEMALE	IDBxxS	2.92	3.20	---	4.33	6.76	---
HOODS	METAL	MHOODxx	1.25	1.25	1.30	1.30	---	---
	GREY	HOODxx	.65	.65	---	.65	.75	.95

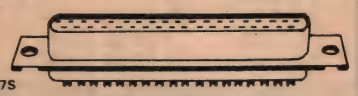
ORDERING INSTRUCTIONS: INSERT THE NUMBER OF CONTACTS IN THE POSITION MARKED "xx" OF THE "ORDER BY" PART NUMBER LISTED.

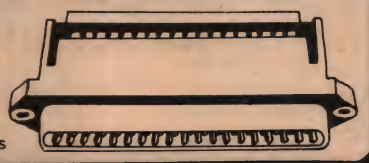
EXAMPLE: A 15 PIN RIGHT ANGLE MALE PC SOLDER WOULD BE DB15PR.

MOUNTING HARDWARE $1.00

MTG HDWR


HOOD25

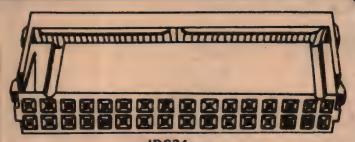

DB37S

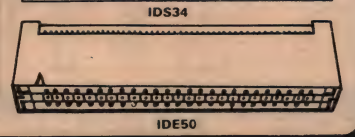

IDB37S

IDC CONNECTORS

DESCRIPTION	ORDER BY	CONTACTS 10	20	26	34	40	50
SOLDER HEADER	IDHxxS	.82	1.29	1.68	2.20	2.58	3.24
RIGHT ANGLE SOLDER HEADER	IDHxxSR	.85	1.35	1.76	2.31	2.72	3.39
WW HEADER	IDHxxW	1.86	2.98	3.84	4.50	5.28	6.63
RIGHT ANGLE WW HEADER	IDHxxWR	2.05	3.28	4.22	4.45	4.80	7.30
RIBBON HEADER SOCKET	IDSxx	.79	.99	1.39	1.59	1.99	2.25
RIBBON HEADER	IDMxx	---	5.50	6.25	7.00	7.50	8.50
RIBBON EDGE CARD	IDExx	1.75	2.25	2.65	2.75	3.80	3.95

FOR ORDERING INSTRUCTIONS SEE D-SUBMINIATURE ABOVE


IDS34


IDE50

DIODES/OPTO/TRANSISTORS

1N751	.25	4N26	.69
1N759	.25	4N27	.69
1N4148	25/1.00	4N28	.69
1N4004	10/1.00	4N33	.89
1N5402	.25	4N37	1.19
KBP02	.55	MCT-2	.59
KBU8A	.95	MCT-6	1.29
MDA990-2	.35	TIL-111	.99
N2222	.25	2N3906	.10
PN2222	.10	2N4401	.25
2N2905	.50	2N4402	.25
2N2907	.25	2N4403	.25
2N3055	.79	2N6045	1.75
2N3904	.10	TIP31	.49

LED DISPLAYS

FND-357(359)	COM CATHODE	.362"	1.25
FND-500(503)	COM CATHODE	.5"	1.49
FND-507(510)	COM ANODE	.5"	1.49
MAN-72	COM ANODE	.3"	.99
MAN-74	COM CATHODE	.3"	.99
MAN-8940	COM CATHODE	.8"	1.99
TIL-313	COM CATHODE	.3"	.45
TIL-311	4x7 HEX W/LOGIC	.270"	9.95

DIFFUSED LEDS

		1-99	100-UP
JUMBO RED	T1¾	.10	.09
JUMBO GREEN	T1¾	.14	.12
JUMBO YELLOW	T1¾	.14	.12
MOUNTING HDW	T1¾	.10	.09
MINI RED	T1	.10	.09

SWITCHES

SPDT	MINI-TOGGLE ON-ON	1.25
DPDT	MINI-TOGGLE ON-ON	1.50
DPDT	MINI-TOGGLE ON-OFF-ON	1.75
SPST	MINI-PUSHBUTTON N.O.	.39
SPST	MINI-PUSHBUTTON N.C.	.39
BCD OUTPUT 10 POSITION 6 PIN DIP		1.95

DIP SWITCHES

4 POSITION	.85	7 POSITION	.95
5 POSITION	.90	8 POSITION	.95
6 POSITION	.90	10 POSITION	1.29

RIBBON CABLE

CONTACTS	SINGLE COLOR 1'	10'	COLOR CODED 1'	10'
10	.18	1.60	.30	2.75
16	.28	2.50	.48	4.40
20	.36	3.20	.60	5.50
25	.45	4.00	.75	6.85
26	.46	4.10	.78	7.15
34	.61	5.40	1.07	9.35
40	.72	6.40	1.20	11.00
50	.89	7.50	1.50	13.25

HARD TO FIND "SNAPABLE" HEADERS

CAN BE SNAPPED APART TO MAKE ANY SIZE HEADER, ALL WITH .1" CENTERS

1x40	STRAIGHT LEAD	.99
1x40	RIGHT ANGLE	1.49
2x40	STRAIGHT LEAD	2.49
2x40	RIGHT ANGLE	2.99

SHORTING BLOCKS

GOLD CONTACTS SPACED AT .1" CENTERS

5/$1.00

As a highly satisfied customer, I wish to praise the speedy and efficient ways in which my previous orders were handled. The quality of your merchandise is excellent and the prices are set to suit my budget. I have already reccomended your company to many of my colleagues and associates.

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BARGAIN HUNTERS CORNER

KEY TRONIC™ $49.95
5150 STYLE OEM KEYBOARD
- ★ IMPROVED KEYBOARD LAYOUT
- ★ 83 KEYS, FULLY IBM COMPATIBLE
- ★ LED INDICATORS FOR CAPS & NUMBER LOCK

MITSUBISHI $129.95
HIGH DENSITY DRIVE
- ★ IBM PC/AT COMPATIBLE
- ★ 1.2 MEGABYTE, ½ HEIGHT FDD
- ★ READS DS/DD OR DS/DH DISKETTES
- ★ QUIET & RELIABLE

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PRECUT ASSORTMENT
IN ASSORTED COLORS $27.50
100ea: 5.5", 6.0", 6.5", 7.0"
250ea: 2.5", 4.5", 5.0"
500ea: 3.0", 3.5", 4.0"

SPOOLS

100 feet	$4.30	250 feet	$7.25
500 feet	$13.25	1000 feet	$21.95

Please specify color:
Blue, Black, Yellow or Red

EMI FILTER $4.95
- * MANUFACTURED BY CORCOM
- * LOW COST
- * FITS LC-HP BELOW
- * 6 AMP 120/240 VOLT

6 FOOT LINE CORDS

LC-2	2 CONDUCTOR	.39
LC-3	3 CONDUCTOR	.99
LC-HP	3 CONDUCTOR W/STD FEMALE SOCKET	1.49

MUFFIN FANS

3.15" SQ.	ROTRON	14.95
3.63" SQ.	ETRI	14.95
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WIRE WRAP PROTOTYPE CARDS
FR-4 EPOXY GLASS LAMINATE
WITH GOLD-PLATED EDGE-CARD FINGERS

IBM-PR2

IBM
BOTH CARDS HAVE SILK SCREENED LEGENDS AND INCLUDES MOUNTING BRACKET

IBM-PR1	WITH +5V AND GROUND PLANE	$27.95
IBM-PR2	AS ABOVE WITH DECODING LAYOUT	$29.95

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P100-1	BARE - NO FOIL PADS	$15.15
P100-2	HORIZONTAL BUS	$21.80
P100-3	VERTICAL BUS	$21.80
P100-4	SINGLE FOIL PADS PER HOLE	$22.75

APPLE

P500-1	BARE - NO FOIL PADS	$15.15
P500-3	HORIZONTAL BUS	$22.75
P500-4	SINGLE FOIL PADS PER HOLE	$21.80
7060-45	FOR APPLE IIe AUX SLOT	$30.00

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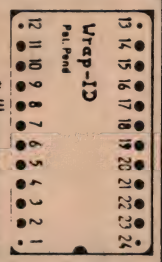
- * SLIPS OVER WIRE WRAP PINS
- * IDENTIFIES PIN NUMBERS ON WRAP SIDE OF BOARD
- * CAN WRITE ON PLASTIC; SUCH AS IC #

PINS	PART#	PCK. OF	PRICE
8	IDWRAP 08	10	1.95
14	IDWRAP 14	10	1.95
16	IDWRAP 16	10	1.95
18	IDWRAP 18	5	1.95
20	IDWRAP 20	5	1.95
22	IDWRAP 22	5	1.95
24	IDWRAP 24	5	1.95
28	IDWRAP 28	5	1.95
40	IDWRAP 40	5	1.95

PLEASE ORDER BY NUMBER OF PACKAGES (PCK. OF)



ID WRAP 24

FRAME STYLE TRANSFORMERS

12.6V AC CT	2 AMP	5.95
12.6V AC CT	4 AMP	7.95
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25.2V AC CT	2 AMP	7.95

25 PIN D-SUB GENDER CHANGERS $7.95

SWITCHING POWER SUPPLIES

PS-IBM $69.95
- * FOR IBM PC-XT COMPATIBLE
- * 135 WATTS
- * +5V @ 15A, +12V @ 4.2A -5V @ .5A, -12V @ .5A
- * ONE YEAR WARRANTY

PS-IBM 150

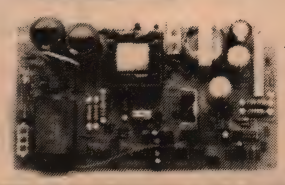
PS-IBM-150 $79.95
- * FOR IBM PC-XT COMPATIBLE
- * 150 WATTS
- * +12V @ 5.2A, +5V @ 16A -12V @ .5A, -5V @ .5A
- * ONE YEAR WARRANTY

PS-130

PS-130 $99.95
- * 130 WATTS
- * SWITCH ON REAR
- * FOR USE IN OTHER IBM TYPE MACHINES
- * 90 DAY WARRANTY

PS-A

PS-A $49.95
- * USE TO POWER APPLE TYPE SYSTEMS, 79.5 WATTS
- * +5V @ 7A, +12V @ 3A -5V @ .5A, -12V @ .5A
- * APPLE POWER CONNECTOR



PS-1558

PS-1558 $34.95
- * 75 WATTS, UL APPROVED
- * +5V @ 7A, +12V @ 3A -12V @ 250ma, -5V @ 300ma

CAPACITORS

TANTALUM

1.0µf	15V	.35	.47µf	35V	.45
6.8	15V	.70	1.0	35V	.45
10	15V	.80	2.2	35V	.65
22	15V	1.35	4.7	35V	.85
.22	35V	.40	10	35V	1.00

DISC

10pf	50V	.05	680	50V	.05
22	50V	.05	.001µf	50V	.05
27	50V	.05	.0022	50V	.05
33	50V	.05	.005	50V	.05
47	50V	.05	.01	50V	.07
68	50V	.05	.02	50V	.07
100	50V	.05	.05	50V	.07
220	50V	.05	.1	12V	.10
560	50V	.05	.1	50V	.12

MONOLITHIC

.01µf	50V	.14	.1µf	50V	.18
.047µf	50V	.15	.47µf	50V	.25

ELECTROLYTIC

RADIAL			AXIAL		
1µf	25V	.14	1µf	50V	.14
2.2	35V	.15	10	50V	.16
4.7	50V	.15	22	16V	.14
10	50V	.15	47	50V	.20
47	35V	.18	100	35V	.25
100	16V	.18	220	25V	.30
220	35V	.20	470	50V	.50
470	25V	.30	1000	16V	.60
2200	16V	.70	2200	16V	.70
4700	25V	1.45	4700	16V	1.25

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- * ERASES 2 IN 10 MINUTES
- * COMPACT-NO DRAWER
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50 PCS	same value	.025	1000 PCS	same value	.015

RESISTOR NETWORKS

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SIP	8 PIN	7 RESISTOR	.59
DIP	16 PIN	8 RESISTOR	1.09
DIP	16 PIN	15 RESISTOR	1.09
DIP	14 PIN	7 RESISTOR	.99
DIP	14 PIN	13 RESISTOR	.99

SPECIALS ON BYPASS CAPACITORS

.01 µf CERAMIC DISC	100/$5.00
.01 µf MONOLITHIC	100/$10.00
.1 µf CERAMIC DISC	100/$6.50
.1 µf MONOLITHIC	100/$12.50

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OVER 800 PAGES OF DATA SHEETS ON THE MOST COMMONLY USED ICs. INCLUDES TTL, CMOS, 74LS00, MEMORY, CPUs, MPU SUPPORT. AND MUCH MORE!

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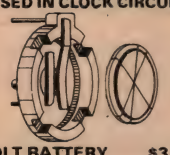
WBU-T	1.38 x 6.50"	---	---	1	630	---	6.95
WBU-204-3	3.94 x 8.45"	1	100	2	1260	2	17.95
WBU-204	5.13 x 8.45"	4	400	2	1260	3	24.95
WBU-206	6.88 x 9.06"	5	500	3	1890	4	29.95
WBU-208	8.25 x 9.45"	7	700	4	2520	4	39.95

WBU-208

LITHIUM BATTERY
AS USED IN CLOCK CIRCUITS



3 VOLT BATTERY	$3.95
BATTERY HOLDER	$1.49

2 VOLUME SET
1986 IC MASTER
THE INDUSTRY STANDARD
$129.95

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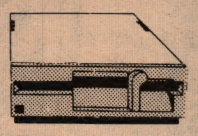
2400 BAUD MODEM FOR IBM WITH PC TALK III SOFTWARE $259!

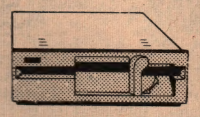
DISK DRIVES
FOR APPLE COMPUTERS

AP-150 $99.95



* ½ HT, DIRECT DRIVE
* 100% APPLE COMPATIBLE
* SIX MONTH WARRANTY

BAL-500 $129.95



* TEAC MECHANISM-DIRECT DRIVE
* 100% APPLE COMPATIBLE
* FULL ONE YEAR WARRANTY

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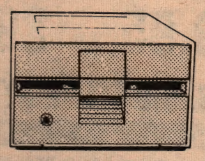

* FULL HT SHUGART MECHANISM
* DIRECT REPLACEMENT FOR APPLE DISK II
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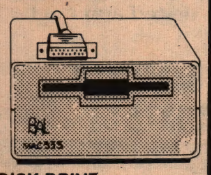

* 3.5" ADD-ON DISK DRIVE
* 100% MACINTOSH COMPATABLE
* DOUBLE SIDED 800K BYTE STORAGE
* HIGH RELIABILITY DRIVE HAS AUTO-EJECT MECHANISM
* FULL ONE YEAR WARRANTY

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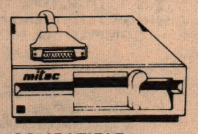

* 100% APPLE IIc COMPATIBLE, READY TO PLUG IN, W/SHIELDED CABLE & MOLDED 19 PIN CONNECTOR
* FAST, RELIABLE SLIMLINE DIRECT DRIVE
* SIX MONTH WARRANTY

DISK DRIVE ACCESSORIES

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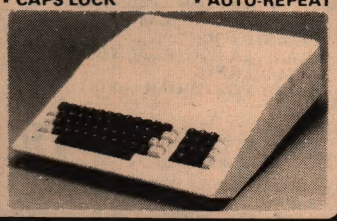
IIc ADAPTOR CABLE	$19.95

ADAPTS STANDARD APPLE DRIVES FOR USE WITH APPLE IIc

KB-1000 $79.95

CASE WITH KEYBOARD FOR APPLE TYPE MOTHERBOARD

* USER DEFINED FUNCTION KEYS
* NUMERIC KEYPAD WITH CURSOR CONTROL
* CAPS LOCK
* AUTO-REPEAT



KEYBOARD-AP $49.95

* REPLACEMENT FOR APPLE II KEYBOARD
* CAPS LOCK KEY, AUTO-REPEAT
* ONE KEY ENTRY OF BASIC OR CP/M COMMANDS

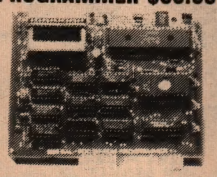
EXTENDER CARDS

IBM-PC	$45.00
IBM-AT	$68.00
APPLE II	$45.00
APPLE IIe	$45.00
MULTIBUS	$86.00

APPLE COMPATIBLE INTERFACE CARDS

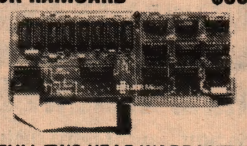
EPROM PROGRAMMER $59.95

MODEL RP525



* DUPLICATE OR BURN ANY STANDARD 27xx SERIES EPROM
* EASY TO USE MENU-DRIVEN SOFTWARE IS INCLUDED
* MENU SELECTION FOR 2716, 2732, 2732A, 2764 AND 27128
* HIGH SPEED WRITE ALGORITHM
* LED INDICATORS FOR ACTIVITY
* NO EXTERNAL POWER SUPPLY NEEDED
* ONE YEAR WARRANTY

16K RAMCARD $39.95



* FULL TWO YEAR WARRANTY
* EXPAND YOUR 48K APPLE TO 64K
* USE IN PLACE OF APPLE LANGUAGE CARD

BARE PC CARD W/INSTRUCTIONS $9.95

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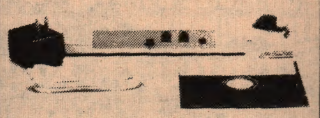
* QUICKLY TESTS MANY COMMON ICs
* DISPLAYS PASS OR FAIL
* ONE YEAR WARRANTY
* TESTS: 4000 SERIES CMOS, 74HC SERIES CMOS, 7400, 74LS, 74L, 74H & 74S

300B MODEM $49.95
FOR APPLE OR IBM

INCLUDES ASCII PRO-EZ SOFTWARE



* FCC APPROVED
* BELL SYSTEMS 103 COMPATIBLE
* INCLUDES AC ADAPTOR
* AUTO-DIAL
* DIRECT CONNECT

CABLE FOR APPLE IIc $14.95

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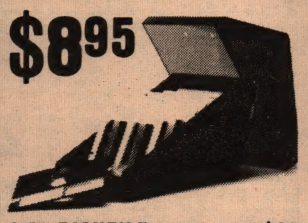
FOR ATARI 400, 800, 2600, VIC 20/64 AND APPLE IIe

DISKFILE

HOLDS 70 5¼" DISKETTES

$8.95



3.5" DISKFILE HOLDS 40 **$9.95**

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* UL APPROVED
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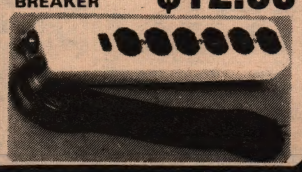

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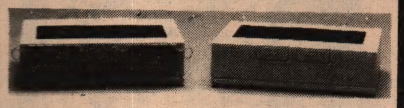

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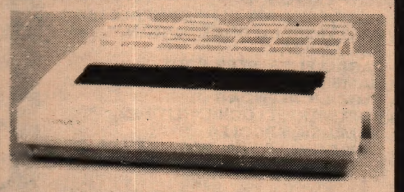

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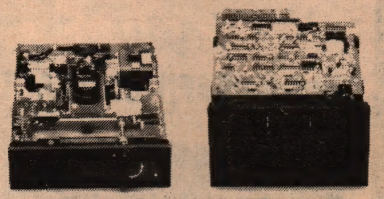

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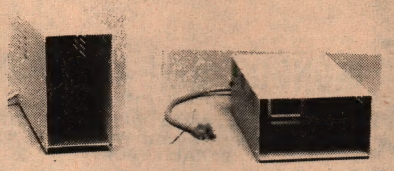

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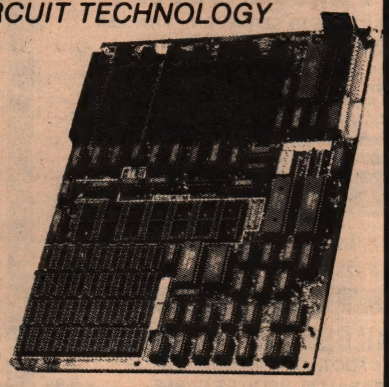

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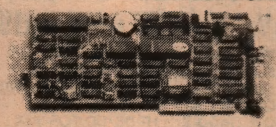

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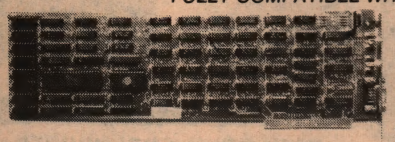

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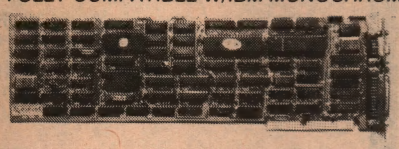

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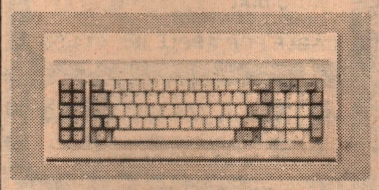

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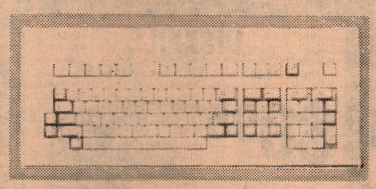

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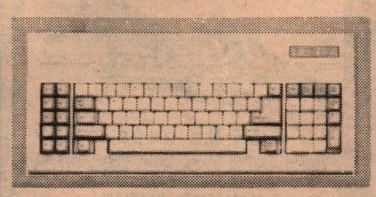

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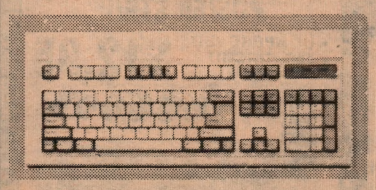

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